

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

## SEQUENCE LISTING

<110> BAUMANN, PETER  
CECH, THOMAS R.

<120> PROTECTION-OF-TELOMERE-1 (POT-1) PROTEIN AND ENCODING  
POLYNUCLEOTIDES

<130> 089491/0201

<140> 09/816,248

<141> 2001-03-26

<160> 45

<170> PatentIn Ver. 2.1

<210> 1

<211> 118

<212> PRT

<213> Euplotes crassus

<400> 1

Gln Lys Ala Ala Lys Lys Asp His Tyr Gln Tyr Ser Asp Leu Ser Ser  
1 5 10 15

Ile Lys Lys Glu Gly Glu Glu Asp Gln Tyr His Phe Tyr Gly Val Val  
20 25 30

Ile Asp Ala Ser Phe Pro Tyr Lys Gly Glu Lys Arg Tyr Val Val Thr  
35 40 45

Cys Lys Val Ala Asp Pro Ser Ser Val Ala Lys Gly Gly Lys Leu Asn  
50 55 60

Thr Val Asn Val Val Phe Phe Ser Gln Asn Phe Glu Asp Leu Pro Ile  
65 70 75 80

Ile Gln Arg Val Gly Asp Ile Val Arg Val His Arg Ala Arg Leu Gln  
85 90 95

His Tyr Asn Asp Ala Lys Gln Leu Asn Val Asn Met Tyr Tyr Arg Ser  
100 105 110

Ser Trp Cys Leu Phe Ile  
115

<210> 2

<211> 123

<212> PRT

<213> Stylonychia mytilis

<400> 2

Lys Lys Arg Glu Gln Ser Thr Arg Tyr Lys Tyr Val Glu Leu Asn Lys  
1 5 10 15

COPY

Ala Ser Leu Thr Ser Ala Glu Ala Gln His Phe Tyr Gly Val Val Ile  
20 25 30

Asp Ala Thr Phe Pro Tyr Lys Thr Asn Gln Glu Arg Tyr Ile Cys Ser  
35 40 45

Leu Lys Val Val Asp Pro Ser Leu Tyr Leu Lys Ser Gln Lys Gly Thr  
50 55 60

Gly Asp Ala Ser Asp Tyr Ala Thr Leu Val Leu Tyr Ala Lys Arg Phe  
65 70 75 80

Glu Asp Leu Pro Ile Ile His Arg Ile Gly Asp Ile Ile Arg Val His  
85 90 95

Arg Ala Thr Leu Arg Leu Tyr Asn Gly Gln Arg Gln Phe Asn Ala Asn  
100 105 110

Val Phe Tyr Asn Ser Ser Trp Ala Leu Phe Ser  
115 120

<210> 3

<211> 123

<212> PRT

<213> Oxytricha trifallax

<400> 3

Lys Lys Ala Glu Lys Gly Ser Lys Tyr Glu Tyr Val Glu Leu Thr Lys  
1 5 10 15

Ala Gln Leu Thr Ser Val Thr Ala Gln His Phe Tyr Ala Val Val Ile  
20 25 30

Asp Ala Thr Phe Pro Tyr Lys Thr Asn Gln Glu Arg Tyr Ile Cys Ser  
35 40 45

Leu Lys Ile Val Asp Pro Ser Leu Tyr Leu Lys Lys Glu Lys Gly Thr  
50 55 60

Gly Asp Asn Ser Asp Tyr Ala Thr Leu Val Leu Tyr Ala Lys Arg Phe  
65 70 75 80

Glu Asp Leu Pro Ile Ile His Arg Leu Gly Asp Ile Ile Arg Ile His  
85 90 95

Arg Ala Thr Ile Arg Leu Tyr Asn Gly Gln Arg Gln Phe Asn Ala Asn  
100 105 110

Ile Phe Tyr Ser Ser Ser Trp Ala Leu Phe Ser  
115 120

<210> 4

<211> 123

<212> PRT

<213> Oxytricha nova

&lt;400&gt; 4

Lys Lys Ser Asp Lys Gly His Lys Tyr Glu Tyr Val Glu Leu Ala Lys  
 1 5 10 15

Ala Ser Leu Thr Ser Ala Gln Pro Gln His Phe Tyr Ala Val Val Ile  
 20 25 30

Asp Ala Thr Phe Pro Tyr Lys Thr Asn Gln Glu Arg Tyr Ile Cys Ser  
 35 40 45

Leu Lys Ile Val Asp Pro Thr Leu Tyr Leu Lys Gln Gln Lys Gly Ala  
 50 55 60

Gly Asp Ala Ser Asp Tyr Ala Thr Leu Val Leu Tyr Ala Lys Arg Phe  
 65 70 75 80

Glu Asp Leu Pro Ile Ile His Arg Ala Gly Asp Ile Ile Arg Val His  
 85 90 95

Arg Ala Thr Leu Arg Leu Tyr Asn Gly Gln Arg Gln Phe Asn Ala Asn  
 100 105 110

Val Phe Tyr Ser Ser Ser Trp Ala Leu Phe Ser  
 115 120

&lt;210&gt; 5

&lt;211&gt; 109

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 5

Met Ser Leu Val Pro Ala Thr Asn Tyr Ile Tyr Thr Pro Leu Asn Gln  
 1 5 10 15

Leu Lys Gly Gly Thr Ile Val Asn Val Tyr Gly Val Val Lys Phe Phe  
 20 25 30

Lys Pro Pro Tyr Leu Ser Lys Gly Thr Asp Tyr Cys Ser Val Val Thr  
 35 40 45

Ile Val Asp Gln Thr Asn Val Lys Leu Thr Cys Leu Leu Phe Ser Gly  
 50 55 60

Asn Tyr Glu Ala Leu Pro Ile Ile Tyr Lys Asn Gly Asp Ile Val Arg  
 65 70 75 80

Phe His Arg Leu Lys Ile Gln Val Tyr Lys Lys Glu Thr Gln Gly Ile  
 85 90 95

Thr Ser Ser Gly Phe Ala Ser Leu Thr Phe Glu Gly Thr  
 100 105

&lt;210&gt; 6

&lt;211&gt; 116

&lt;212&gt; PRT

&lt;213&gt; Schizosaccharomyces pombe

&lt;400&gt; 6

Lys Ile Gly Glu Leu Thr Phe Gln Ser Ile Arg Ser Ser Gln Glu Leu  
 1 5 10 15

Gln Lys Lys Asn Thr Ile Val Asn Leu Phe Gly Ile Val Lys Asp Phe  
 20 25 30

Thr Pro Ser Arg Gln Ser Leu His Gly Thr Lys Asp Trp Val Thr Thr  
 35 40 45

Val Tyr Leu Trp Asp Pro Thr Cys Asp Thr Ser Ser Ile Gly Leu Gln  
 50 55 60

Ile His Leu Phe Ser Lys Gln Gly Asn Asp Leu Pro Val Ile Lys Gln  
 65 70 75 80

Val Gly Gln Pro Leu Leu Leu His Gln Ile Thr Leu Arg Ser Tyr Arg  
 85 90 95

Asp Arg Thr Gln Gly Leu Ser Lys Asp Gln Phe Arg Tyr Ala Leu Trp  
 100 105 110

Pro Asp Phe Ser  
 115

&lt;210&gt; 7

&lt;211&gt; 3980

&lt;212&gt; DNA

&lt;213&gt; Schizosaccharomyces pombe

&lt;400&gt; 7

tatgagtga gttccatcca tgatgcaaaa agccatgctg tcaaccttaa aaagtatatc 60  
 ggccattccc gatgatgtac cccctcctta ttctgagttt gctgatgata cgacagcgca 120  
 agctggttct agtaaaagag atagcgctat atctgaagat cccgatcatc acaaaagtgt 180  
 ttggtggtct ttgagatggc aatctcggct tggtggctcg ggaaaatcta ctgctcttac 240  
 tcctgaagaa accagagcaa tacaggagca ggcaaagaca ctgaaaaagg caggaatgga 300  
 ctttatgcta ttctctttct ggttacctgc cctacttttg ctgagtatct ttggtcttcg 360  
 aagctatgct caaatgatcg ggggatattt atatcgctgc ataattggca tttaggtttg 420  
 acgaacaacc atgcatgttt tttcttttct tttagtttta ttcttttttg tagattatga 480  
 gcaaaactact gtcaaaactt aggtattatg acaatgaaat cgtatatatt atattcgatt 540  
 ggatcaattt tttattatat tgaaagtaat tgcttatttt gtaagttaaa cttacatggg 600  
 tttaaacgca tagagcaggt tggcgctttt aaaacaaaa tagatcggtg caggtttgct 660  
 gttctggatc gtgaatgcaa taccttagga aagtctttta ataagctatc gctttttgca 720  
 ttgcattctt tttctaaact gaacgttaga ttagctaaag taagcgtctt gagttttcga 780  
 gatgaaccgc atacattaaa atttttaagt accaattggc atgaaccggt atgcgatctg 840  
 cttattataa tactagtaaa tcttgatact cggcaaactc tttcaataat agcctagcag 900  
 aaactgggat atgtctaaag ttttacaact gcgctcagct taaggacttt acggcgatcc 960  
 atttaatagc tagccatgaa cactcataac ctcaagattg aggagtgggt cattcttttg 1020  
 cttgataaag aaacaaattc attattggtg aaataaaaact gaataaccct tagttcatcc 1080  
 taggaatttg aagaagggga atgatcaagc ttgaacaagt aactctcacg cagtctattg 1140  
 aataatctga aggttcatca ctttcaaggg gttgtcttgg tttaaaaagc ttttaccat 1200  
 tccatttagg tttctgagaa aggctaaaac tcatttggtg ttcttaaagg atatttggat 1260  
 cattcggtga tcaagcatgg gagaggacgt tattgacagt cttcagttga atgagttatt 1320  
 aaatgctgga gaataaaga ttggagtga ataatcaatg atttatattt gttttgctaa 1380  
 caatgaaaaa ggaacttaca tttcagtcca ttagaagctc tcaagaatta caaagaaga 1440  
 atactattgt caatttgttt ggaatagtaa aagattttac ccctagtcgc caaagtctac 1500

```

atggaactaa ggggtatgctt gcttatcatg gtggaaacta tactttttat ttttccagtc 1560
aagagctaata atcatggttt ttagattggg taaccacccg atatttgtgg gatccaacat 1620
gtgatacatc aagcatcgga ctacagatac acttggttcag caaacaggga aatgatttgc 1680
ctgtaatacaa gcagggtggg caaccgcttt tgcttcatca aatcacatta agaagttata 1740
gagacaggac tcaagggtttg tctaaggatc aatttcgata tgcacttttg ccagactttt 1800
cttctaattc caaagatact ctctgtcctc aaccaatgcc tcgtttaatg aaaacgggag 1860
acaaggaaga gcaattcgcc ttgttggtta ataaaatttg ggatgagcaa actaataaac 1920
ataaaaatgg cgaattattg agtacctctt ctgctcgtca aaatcaaact ggattgagtt 1980
acccttctgt ctctttttct ctgctatcac aaataaactcc acatcaacgt tgtagctttt 2040
acgctcaggt aattaaaact tggtagctg ataaaaactt tactctttat gtcactgatt 2100
atacggaaaa tgagcttttt tttccaatgt ctccgtatac tagctcctcg agatggaggg 2160
gcccttttgg tcgggttttct ataagggtgca ttttatggga tgagcacgac ttttactgcc 2220
gcaactacat taaagaaggt gactatgtgg ttatgaaaaa tgtgcgaacc aaaattgac 2280
accttggtta tctggaatgt atacttcatg gggattcagc aaaacgttat aatatgagta 2340
tagaaaaagt cgattcggaa gaacccgaac taaacgaaat taagtcacgt aaaaggcttt 2400
atgttcagaa ttgccaaaat ggtatagaag cagtaatcga gaaactcagt caaagccaac 2460
aatcggaaaa tcctttttat gcccatgaat taaagcaaac ttctgttaat gaaattacgg 2520
cccatgtcat aaatgaacct gctagttaa aattgactac tatttctacc atacttcatg 2580
cacctttgca gaatcttctc aaaccgagga aacataggct acgcgttcag gtggtagatt 2640
tttgccaaa gagtttgacg cagtttgctg tgctatctca accaccatct tcgtatgttt 2700
ggatgtttgc cttgctcgtg agggatgtat cgaatgtgac tttaccggtc atattttttg 2760
attctgacgc tgcggaactt ataacagct caaaaatcca accttgcaat ttagctgac 2820
acccgcagat gactcttcag cttaaagaaa gattatttct gatttggggg aacttggag 2880
aacgcattca gcatcacata tcgaagggtg aatcgccaac tctggctgct gaagatgttg 2940
aaacaccatg gtttgatata tatgtcaaag aatacattcc tgaattggg aacaccaag 3000
accatcaatc tttgactttt cttcagaagc gctggcgagg atttggcacg aaaattgttt 3060
gactattgtg atacaaaact tacaataatg aaatgcttac ggaaaagaaa cataagaaaa 3120
acaatattta aatttaagga aagctctata ttgggagaat tttataaagc gagcgaattt 3180
gtactaagga aaaacacaga ggggaaacgt gaaatatcta attgcttaga ctttatataa 3240
catcaacttc gaaataatct tagaaattaa ttacaaaaat aataaggatt ggtttgatgt 3300
atggtgggta catctaagca ggcttttgct tagaagttgc aagtgttgag gcatcatcat 3360
caccttcac gtcaacagcg aatagagctt gatgtcctc ggcactgcca tgaataatat 3420
gaggggtggc tggagatgta ggacgctcat gatgcagatg caaactatca tttgagagag 3480
aggaagtcac ctcaaaactc tctacatctt gagcaacttg ctactcatt gcgaaacgac 3540
ggttattctc ggtaggacgc cacaagtaca aaatggtaag catcaagatc aaaacaagaa 3600
tatcagtgta tccgtaatta aggaaccaa gaagtttcca gtattttaag taatagttca 3660
tttgaccgta gataccaatc aaaatggcat tggctgcgac aatcgaagca taagcgacaa 3720
tgccaaaaca tataacaatc caaagacgag tatacatctg agccttaaca gtttgcttac 3780
gaatacggag atcacgaatt gtattattta aagccaatac aatccaaagg aacatagcga 3840
agaggggtgat taaaaagaca ggagcggcaa acaaaatgac caaagactct ttattagatg 3900
ggctaatagaa caaagatgac aagaaaaagc atgaagaaac gaactgcaaa ccagcaagaa 3960
tttgacactt acgaagaaga
3980

```

<210> 8

<211> 2087

<212> DNA

<213> Schizosaccharomyces pombe

<400> 8

```

gattgaggag tgggtcattc ttttgcttga taaagaaaca aattcattat tggtaaaata 60
aaactgaata acccttagtt catcctagga atttgaagaa ggggaatgat caagcttgaa 120
caagtaactc tcacgcagtc tattgaataa tctgaagggt catcactttc aaggggttgt 180
cttggtttta aaagctttta ccaattccat ttaggtttct gagaaaggct aaaactcatt 240
tggtgttctt aaaggatatt tggatcattc gttgatcaag catgggagag gacgttattg 300
acagtcctca gttgaatgag ttattaaatg ctggagaata taagattgga gaactttacat 360
ttcagtcctat tagaagctct caagaattac aaaagaagaa tactattgic aatttggttg 420
gaatagtaaa agattttacc cctagtcgcc aaagtctaca tggaaactaag gattgggtaa 480

```

```

ccaccgtata tttgtgggat ccaacatgtg atacatcaag catcgggacta cagatacact 540
tgttcagcaa acaggggaaat gatttgcttg taatcaagca ggtggggcaa ccgcttttgc 600
ttcatcaaat cacattaaga agttatagag acaggactca aggtttgtct aaggatcaat 660
ttcgatatgc actttggcca gacttttctt ctaattccaa agatactctc tgtcctcaac 720
caatgcctcg tttaatgaaa acgggagaca aggaagagca attcgccttg ttgttaaata 780
aaatttggga tgagcaaaact aataaacata aaaaaggcga attattgagt acctcttctg 840
ctcgtcaaaa tcaaactgga ttgagttacc ctctgtctc ttttctctg ctatcacaaa 900
taactccaca tcaacgttgt agcttttacg ctcaggtaat taaaacttgg tacagtata 960
aaaactttac tctttatgtc actgattata cggaaaatga gctttttttt ccaatgtctc 1020
cgtatactag ctctcgcaga tggaggggccc cttttggctg gttttctata aggtgcattt 1080
tatgggatga gcacgacttt tactgccgca actacattaa agaagggtgac tatgtgggta 1140
tgaaaaatgt gcgaacccaaa attgatcacc ttggttatct ggaatgtata cttcatgggg 1200
attcagcaaa acgttataat atgagtatag aaaaagtcga ttcggaagaa cccgaactaa 1260
acgaaattaa gtcacgtaaa aggtctttatg ttcagaattg ccaaaatggg atagaagcag 1320
taatcgagaa actcagtcaa agccaacaat cggaaaatcc ttttatcgcc catgaattaa 1380
agcaaaactt tgtaaatgaa attacggccc atgtcataaa tgaacctgct agtttaaaat 1440
tgactactat ttctaccata cttcatgcac ctttgcagaa tcttctcaa ccgaggaaac 1500
ataggctacg cgttcaggtg gtagattttt ggccaagagag tttgacgcag tttgctgtgc 1560
tatctcaacc accatcttcg tatgtttgga tgtttgcctt gctcgtaagg gatgtatcga 1620
atgtgacttt accggtcata ttttttgatt ctgacgctgc ggaacttatt aacagctcaa 1680
aaatccaacc ttgcaattta gctgatcacc cgcatatgac tcttcagctt aaagaaagat 1740
tatttctgat ttgggggaac ttggaagaac gcattcagca tcacatatcg aagggtgaat 1800
cgccaactct ggctgctgaa gatgttgaaa caccatgggt tgatatatat gtcaaagaat 1860
acattcctgt aattgggaac accaaagacc atcaatcttt gacttttctt cagaagcgct 1920
ggcgaggatt tggcacgaaa attgtttgac tattgtgata caaaacttac aataatgaaa 1980
tgcttacgga aaagaaacat aagaaaaaca atattttaa ttaaggaaag ctctatatgt 2040
ggagaatttt ataaagcgag cgaatttgta ctaaggaaaa acacaga 2087

```

<210> 9  
 <211> 555  
 <212> PRT  
 <213> Schizosaccharomyces pombe

<400> 9  
 Met Gly Glu Asp Val Ile Asp Ser Leu Gln Leu Asn Glu Leu Leu Asn  
 1 5 10 15  
 Ala Gly Glu Tyr Lys Ile Gly Glu Leu Thr Phe Gln Ser Ile Arg Ser  
 20 25 30  
 Ser Gln Glu Leu Gln Lys Lys Asn Thr Ile Val Asn Leu Phe Gly Ile  
 35 40 45  
 Val Lys Asp Phe Thr Pro Ser Arg Gln Ser Leu His Gly Thr Lys Asp  
 50 55 60  
 Trp Val Thr Thr Val Tyr Leu Trp Asp Pro Thr Cys Asp Thr Ser Ser  
 65 70 75 80  
 Ile Gly Leu Gln Ile His Leu Phe Ser Lys Gln Gly Asn Asp Leu Pro  
 85 90 95  
 Val Ile Lys Gln Val Gly Gln Pro Leu Leu Leu His Gln Ile Thr Leu  
 100 105 110  
 Arg Ser Tyr Arg Asp Arg Thr Gln Gly Leu Ser Lys Asp Gln Phe Arg  
 115 120 125

Tyr Ala Leu Trp Pro Asp Phe Ser Ser Asn Ser Lys Asp Thr Leu Cys  
 130 135 140  
 Pro Gln Pro Met Pro Arg Leu Met Lys Thr Gly Asp Lys Glu Glu Gln  
 145 150 155 160  
 Phe Ala Leu Leu Leu Asn Lys Ile Trp Asp Glu Gln Thr Asn Lys His  
 165 170 175  
 Lys Asn Gly Glu Leu Leu Ser Thr Ser Ser Ala Arg Gln Asn Gln Thr  
 180 185 190  
 Gly Leu Ser Tyr Pro Ser Val Ser Phe Ser Leu Leu Ser Gln Ile Thr  
 195 200 205  
 Pro His Gln Arg Cys Ser Phe Tyr Ala Gln Val Ile Lys Thr Trp Tyr  
 210 215 220  
 Ser Asp Lys Asn Phe Thr Leu Tyr Val Thr Asp Tyr Thr Glu Asn Glu  
 225 230 235 240  
 Leu Phe Phe Pro Met Ser Pro Tyr Thr Ser Ser Ser Arg Trp Arg Gly  
 245 250 255  
 Pro Phe Gly Arg Phe Ser Ile Arg Cys Ile Leu Trp Asp Glu His Asp  
 260 265 270  
 Phe Tyr Cys Arg Asn Tyr Ile Lys Glu Gly Asp Tyr Val Val Met Lys  
 275 280 285  
 Asn Val Arg Thr Lys Ile Asp His Leu Gly Tyr Leu Glu Cys Ile Leu  
 290 295 300  
 His Gly Asp Ser Ala Lys Arg Tyr Asn Met Ser Ile Glu Lys Val Asp  
 305 310 315 320  
 Ser Glu Glu Pro Glu Leu Asn Glu Ile Lys Ser Arg Lys Arg Leu Tyr  
 325 330 335  
 Val Gln Asn Cys Gln Asn Gly Ile Glu Ala Val Ile Glu Lys Leu Ser  
 340 345 350  
 Gln Ser Gln Gln Ser Glu Asn Pro Phe Ile Ala His Glu Leu Lys Gln  
 355 360 365  
 Thr Ser Val Asn Glu Ile Thr Ala His Val Ile Asn Glu Pro Ala Ser  
 370 375 380  
 Leu Lys Leu Thr Thr Ile Ser Thr Ile Leu His Ala Pro Leu Gln Asn  
 385 390 395 400  
 Leu Leu Lys Pro Arg Lys His Arg Leu Arg Val Gln Val Val Asp Phe  
 405 410 415  
 Trp Pro Lys Ser Leu Thr Gln Phe Ala Val Leu Ser Gln Pro Pro Ser  
 420 425 430



Ser Tyr Val Trp Met Phe Ala Leu Leu Val Arg Asp Val Ser Asn Val  
435 440 445

Thr Leu Pro Val Ile Phe Phe Asp Ser Asp Ala Ala Glu Leu Ile Asn  
450 455 460

Ser Ser Lys Ile Gln Pro Cys Asn Leu Ala Asp His Pro Gln Met Thr  
465 470 475 480

Leu Gln Leu Lys Glu Arg Leu Phe Leu Ile Trp Gly Asn Leu Glu Glu  
485 490 495

Arg Ile Gln His His Ile Ser Lys Gly Glu Ser Pro Thr Leu Ala Ala  
500 505 510

Glu Asp Val Glu Thr Pro Trp Phe Asp Ile Tyr Val Lys Glu Tyr Ile  
515 520 525

Pro Val Ile Gly Asn Thr Lys Asp His Gln Ser Leu Thr Phe Leu Gln  
530 535 540

Lys Arg Trp Arg Gly Phe Gly Thr Lys Ile Val  
545 550 555

<210> 10

<211> 1740

<212> DNA

<213> Schizosaccharomyces pombe

<400> 10

```

atgggagagg acgttattga cagtcttcag ttgaatgagt tattaaatgc tggagaatat 60
aagattggag aacttacatt tcagtcattt agaagctctc aagaattaca aaagaagaat 120
actattgtca atttgtttgg aatagtaaaa gattttaccc ctatgcgcca aagtctacat 180
ggaactaagg gtatgcttgc ttatcatggt ggaaactata ctttttattt ttccagtcaa 240
gagctaataa tcatgttttt agattgggta accaccgtat atttgtggga tccaacatgt 300
gatacatcaa gcatcggact acagatacac ttgttcagca aacagggaaa tgattgcct 360
gtaatcaagc aggtggggca accgcttttg cttcatcaaa tcacattaag aagtataga 420
gacaggactc aaggtttgtc taaggatcaa ttctgatatg cactttggcc agacttttct 480
tctaattcca aagatactct ctgtcctcaa ccaatgcctc gtttaatgaa aacgggagac 540
aaggaagagc aattcgcttt gttgttaaat aaaatttggg atgagcaaac taataaacat 600
aaaaatggcg aattattgag tacctcttct gctcgtcaaa atcaaactgg attgagttac 660
ccttctgtct ctttttctct gctatcacia ataactccac atcaacgttg tagcttttac 720
gctcaggtaa ttaaaacttg gtacagtgat aaaaacttta ctctttatgt cactgattat 780
acggaaaatg agcttttttt tccaatgtct cgtatacta gtcctcgag atggaggggc 840
ccttttggtc ggttttctat aaggtgcatt ttatgggatg agcacgactt ttactgccgc 900
aactacatta aagaaggtga ctatgtggtt atgaaaaatg tgcaaccaa aattgatcac 960
cttggttatc tggaatgtat acttcattgg gattcagcaa aacgttataa tatgagtata 1020
gaaaaagtcg attcggaaag acccgaacta aacgaaatta agtcacgtaa aaggctttat 1080
gttcagaatt gccaaaatgg tatagaagca gtaatcgaga aactcagtca aagccaacaa 1140
tcggaaaatc cttttatcgc ccatgaatta aagcaaactt ctgttaatga aattacggcc 1200
catgtcataa atgaacctgc tagtttaaaa ttgactacta tttctaccat acttcatgca 1260
cctttgcaga atcttctcaa accgaggaaa cataggctac gcgttcaggt ggtagatttt 1320
tgcccaaaga gtttgacgca gtttgctgtg ctatctcaac caccatcttc gtatgtttgg 1380
atgtttgcct tgctcgttaag ggatgtatcg aatgtgactt taccggtcat attttttgat 1440
tctgacgctg cggaacttat taacagctca aaaatccaac cttgcaattt agctgatcac 1500
ccgcagatga ctcttcagct taaagaaaga ttatttctga tttgggggaa cttggaagaa 1560
cgcattcagc atcacatatc gaagggtgaa tcgccaactc tggctgctga agatgttgaa 1620

```

acaccatggt ttgatataata tgtcaaagaa tacattcctg taattgggaa caccaaagac 1680  
catcaatctt tgacttttct tcagaagcgc tggcgaggat ttggcacgaa aattgtttga 1740

<210> 11  
<211> 579  
<212> PRT  
<213> Schizosaccharomyces pombe

<400> 11  
Met Gly Glu Asp Val Ile Asp Ser Leu Gln Leu Asn Glu Leu Leu Asn  
1 5 10 15  
Ala Gly Glu Tyr Lys Ile Gly Glu Leu Thr Phe Gln Ser Ile Arg Ser  
20 25 30  
Ser Gln Glu Leu Gln Lys Lys Asn Thr Ile Val Asn Leu Phe Gly Ile  
35 40 45  
Val Lys Asp Phe Thr Pro Ser Arg Gln Ser Leu His Gly Thr Lys Gly  
50 55 60  
Met Leu Ala Tyr His Gly Gly Asn Tyr Thr Phe Tyr Phe Ser Ser Gln  
65 70 75 80  
Glu Leu Ile Ile Met Phe Leu Asp Trp Val Thr Thr Val Tyr Leu Trp  
85 90 95  
Asp Pro Thr Cys Asp Thr Ser Ser Ile Gly Leu Gln Ile His Leu Phe  
100 105 110  
Ser Lys Gln Gly Asn Asp Leu Pro Val Ile Lys Gln Val Gly Gln Pro  
115 120 125  
Leu Leu Leu His Gln Ile Thr Leu Arg Ser Tyr Arg Asp Arg Thr Gln  
130 135 140  
Gly Leu Ser Lys Asp Gln Phe Arg Tyr Ala Leu Trp Pro Asp Phe Ser  
145 150 155 160  
Ser Asn Ser Lys Asp Thr Leu Cys Pro Gln Pro Met Pro Arg Leu Met  
165 170 175  
Lys Thr Gly Asp Lys Glu Glu Gln Phe Ala Leu Leu Leu Asn Lys Ile  
180 185 190  
Trp Asp Glu Gln Thr Asn Lys His Lys Asn Gly Glu Leu Leu Ser Thr  
195 200 205  
Ser Ser Ala Arg Gln Asn Gln Thr Gly Leu Ser Tyr Pro Ser Val Ser  
210 215 220  
Phe Ser Leu Leu Ser Gln Ile Thr Pro His Gln Arg Cys Ser Phe Tyr  
225 230 235 240  
Ala Gln Val Ile Lys Thr Trp Tyr Ser Asp Lys Asn Phe Thr Leu Tyr  
245 250 255

Val Thr Asp Tyr Thr Glu Asn Glu Leu Phe Phe Pro Met Ser Pro Tyr  
 260 265 270  
 Thr Ser Ser Ser Arg Trp Arg Gly Pro Phe Gly Arg Phe Ser Ile Arg  
 275 280 285  
 Cys Ile Leu Trp Asp Glu His Asp Phe Tyr Cys Arg Asn Tyr Ile Lys  
 290 295 300  
 Glu Gly Asp Tyr Val Val Met Lys Asn Val Arg Thr Lys Ile Asp His  
 305 310 315 320  
 Leu Gly Tyr Leu Glu Cys Ile Leu His Gly Asp Ser Ala Lys Arg Tyr  
 325 330 335  
 Asn Met Ser Ile Glu Lys Val Asp Ser Glu Glu Pro Glu Leu Asn Glu  
 340 345 350  
 Ile Lys Ser Arg Lys Arg Leu Tyr Val Gln Asn Cys Gln Asn Gly Ile  
 355 360 365  
 Glu Ala Val Ile Glu Lys Leu Ser Gln Ser Gln Gln Ser Glu Asn Pro  
 370 375 380  
 Phe Ile Ala His Glu Leu Lys Gln Thr Ser Val Asn Glu Ile Thr Ala  
 385 390 395 400  
 His Val Ile Asn Glu Pro Ala Ser Leu Lys Leu Thr Thr Ile Ser Thr  
 405 410 415  
 Ile Leu His Ala Pro Leu Gln Asn Leu Leu Lys Pro Arg Lys His Arg  
 420 425 430  
 Leu Arg Val Gln Val Val Asp Phe Trp Pro Lys Ser Leu Thr Gln Phe  
 435 440 445  
 Ala Val Leu Ser Gln Pro Pro Ser Ser Tyr Val Trp Met Phe Ala Leu  
 450 455 460  
 Leu Val Arg Asp Val Ser Asn Val Thr Leu Pro Val Ile Phe Phe Asp  
 465 470 475 480  
 Ser Asp Ala Ala Glu Leu Ile Asn Ser Ser Lys Ile Gln Pro Cys Asn  
 485 490 495  
 Leu Ala Asp His Pro Gln Met Thr Leu Gln Leu Lys Glu Arg Leu Phe  
 500 505 510  
 Leu Ile Trp Gly Asn Leu Glu Glu Arg Ile Gln His His Ile Ser Lys  
 515 520 525  
 Gly Glu Ser Pro Thr Leu Ala Ala Glu Asp Val Glu Thr Pro Trp Phe  
 530 535 540  
 Asp Ile Tyr Val Lys Glu Tyr Ile Pro Val Ile Gly Asn Thr Lys Asp  
 545 550 555 560

His Gln Ser Leu Thr Phe Leu Gln Lys Arg Trp Arg Gly Phe Gly Thr  
 565 570 575

Lys Ile Val

<210> 12  
 <211> 1905  
 <212> DNA  
 <213> Homo sapiens

<400> 12  
 atgtctttgg ttccagcaac aaattatata tatacacccc tgaatcaact taaggggtggt 60  
 acaattgtca atgtctatgg tgttgtgaag ttctttaagc ccccatatct aagcaaagga 120  
 actgattatt gctcagttgt aactattgtg gaccagacaa atgtaaaact aacttgcttg 180  
 ctcttttagtg gaaactatga agcccttcca ataatttata aaaatggaga tattgttcgc 240  
 ttccacaggc tgaagattca agtatataaa aaggagactc agggatcac cagctctggc 300  
 tttgcatctt tgacgtttga gggaactttg ggagccccca tcatacctcg cacttcaagc 360  
 aagtatttta acttcactac tgaggaccac aaaatggtag aagccttacg tgtttgggca 420  
 tctactcata tgtcaccgtc ttggacatta ctaaaattgt gtgatgttca gccaatgcag 480  
 tattttgacc tgacttgtca gctcttgggc aaagcagaag tggacggagc atcatttctt 540  
 cttaaaggat gggatggcac caggacacca ttccatctt ggagagtctt aatacaagac 600  
 cttgttcttg aaggtgattt aagtcacatc catcggtac aaaatctgac aatagacatt 660  
 ttagtctacg ataaccatgt tcatgtggca agatctctga aggttggag ctttcttaga 720  
 atctatagcc ttcatacca aactcaatca atgaattcag agaatcagac aatgttaagt 780  
 ttagagtctt atcttcatgg aggtaccagt tacggctggg gaatcagggt cttgccagaa 840  
 agtaactctg atgtggatca actgaaaaag gatttagaat ctgcaaattt gacagccaat 900  
 cagcattcag atgttatctg tcaatcagaa cctgacgaca gctttccaag ctctggatca 960  
 gtatcattat acgaggtaga aagatgtcaa cagctatctg ctacaatact tacagatcat 1020  
 cagtatttgg agaggacacc actatgtgcc attttgaac aaaaagctcc tcaacaatac 1080  
 cgcacccgag caaaattgag gtcataatag cccagaagac tatttcagtc tgtaaactt 1140  
 cattgcccta aatgtcattt gctgcaagaa gttccacatg agggcgattt ggatataatt 1200  
 tttcaggatg gtgcaactaa aacccagtt gtcaagttac aaaatacatc attatatgat 1260  
 tcaaaaatct ggaccactaa aaatcaaaaa ggacgaaaag tagcagttca ttttgtgaaa 1320  
 aataatggta ttctcccgct ttcaaatgaa tgtctacttt tgatagaagg aggtacactc 1380  
 agtgaaattt gcaaactctc gaacaagttt aatagtgtaa ttctgtgag atctggccac 1440  
 gaagacctgg aacttttggc ctttcagca ccatttctta tacaaggaac aatacatcac 1500  
 tatggatgta aacagtgttc tagtttgaga tccatacaaa atctaaattc cctggttgat 1560  
 aaaacatcgt ggattccttc ttctgtggca gaagcactgg gtattgtacc cctccaatat 1620  
 gtgtttgtta tgacctttac acttgatgat ggaacaggag tactagaagc ctatctcatg 1680  
 gattctgaca aattcttcca gattccagca tcagaagttc tgatggatga tgaccttcag 1740  
 aaaagtgtgg atatgatcat ggatatgttt tgtcctccag gaataaaaat tgatgcatat 1800  
 ccgtggttgg aatgcttcat caagtcatac aatgtcaca atggaacaga taatcaaatt 1860  
 tgctatcaga tttttgacac cacagttgca gaagatgtaa tctaa 1905

<210> 13  
 <211> 634  
 <212> PRT  
 <213> Homo sapiens

<400> 13  
 Met Ser Leu Val Pro Ala Thr Asn Tyr Ile Tyr Thr Pro Leu Asn Gln  
 1 5 10 15  
 Leu Lys Gly Gly Thr Ile Val Asn Val Tyr Gly Val Val Lys Phe Phe  
 20 25 30

Lys Pro Pro Tyr Leu Ser Lys Gly Thr Asp Tyr Cys Ser Val Val Thr  
 35 40 45  
 Ile Val Asp Gln Thr Asn Val Lys Leu Thr Cys Leu Leu Phe Ser Gly  
 50 55 60  
 Asn Tyr Glu Ala Leu Pro Ile Ile Tyr Lys Asn Gly Asp Ile Val Arg  
 65 70 75 80  
 Phe His Arg Leu Lys Ile Gln Val Tyr Lys Lys Glu Thr Gln Gly Ile  
 85 90 95  
 Thr Ser Ser Gly Phe Ala Ser Leu Thr Phe Glu Gly Thr Leu Gly Ala  
 100 105 110  
 Pro Ile Ile Pro Arg Thr Ser Ser Lys Tyr Phe Asn Phe Thr Thr Glu  
 115 120 125  
 Asp His Lys Met Val Glu Ala Leu Arg Val Trp Ala Ser Thr His Met  
 130 135 140  
 Ser Pro Ser Trp Thr Leu Leu Lys Leu Cys Asp Val Gln Pro Met Gln  
 145 150 155 160  
 Tyr Phe Asp Leu Thr Cys Gln Leu Leu Gly Lys Ala Glu Val Asp Gly  
 165 170 175  
 Ala Ser Phe Leu Leu Lys Val Trp Asp Gly Thr Arg Thr Pro Phe Pro  
 180 185 190  
 Ser Trp Arg Val Leu Ile Gln Asp Leu Val Leu Glu Gly Asp Leu Ser  
 195 200 205  
 His Ile His Arg Leu Gln Asn Leu Thr Ile Asp Ile Leu Val Tyr Asp  
 210 215 220  
 Asn His Val His Val Ala Arg Ser Leu Lys Val Gly Ser Phe Leu Arg  
 225 230 235 240  
 Ile Tyr Ser Leu His Thr Lys Leu Gln Ser Met Asn Ser Glu Asn Gln  
 245 250 255  
 Thr Met Leu Ser Leu Glu Phe His Leu His Gly Gly Thr Ser Tyr Gly  
 260 265 270  
 Arg Gly Ile Arg Val Leu Pro Glu Ser Asn Ser Asp Val Asp Gln Leu  
 275 280 285  
 Lys Lys Asp Leu Glu Ser Ala Asn Leu Thr Ala Asn Gln His Ser Asp  
 290 295 300  
 Val Ile Cys Gln Ser Glu Pro Asp Asp Ser Phe Pro Ser Ser Gly Ser  
 305 310 315 320  
 Val Ser Leu Tyr Glu Val Glu Arg Cys Gln Gln Leu Ser Ala Thr Ile  
 325 330 335

Leu Thr Asp His Gln Tyr Leu Glu Arg Thr Pro Leu Cys Ala Ile Leu  
 340 345 350  
 Lys Gln Lys Ala Pro Gln Gln Tyr Arg Ile Arg Ala Lys Leu Arg Ser  
 355 360 365  
 Tyr Lys Pro Arg Arg Leu Phe Gln Ser Val Lys Leu His Cys Pro Lys  
 370 375 380  
 Cys His Leu Leu Gln Glu Val Pro His Glu Gly Asp Leu Asp Ile Ile  
 385 390 395 400  
 Phe Gln Asp Gly Ala Thr Lys Thr Pro Val Val Lys Leu Gln Asn Thr  
 405 410 415  
 Ser Leu Tyr Asp Ser Lys Ile Trp Thr Thr Lys Asn Gln Lys Gly Arg  
 420 425 430  
 Lys Val Ala Val His Phe Val Lys Asn Asn Gly Ile Leu Pro Leu Ser  
 435 440 445  
 Asn Glu Cys Leu Leu Leu Ile Glu Gly Gly Thr Leu Ser Glu Ile Cys  
 450 455 460  
 Lys Leu Ser Asn Lys Phe Asn Ser Val Ile Pro Val Arg Ser Gly His  
 465 470 475 480  
 Glu Asp Leu Glu Leu Leu Asp Leu Ser Ala Pro Phe Leu Ile Gln Gly  
 485 490 495  
 Thr Ile His His Tyr Gly Cys Lys Gln Cys Ser Ser Leu Arg Ser Ile  
 500 505 510  
 Gln Asn Leu Asn Ser Leu Val Asp Lys Thr Ser Trp Ile Pro Ser Ser  
 515 520 525  
 Val Ala Glu Ala Leu Gly Ile Val Pro Leu Gln Tyr Val Phe Val Met  
 530 535 540  
 Thr Phe Thr Leu Asp Asp Gly Thr Gly Val Leu Glu Ala Tyr Leu Met  
 545 550 555 560  
 Asp Ser Asp Lys Phe Phe Gln Ile Pro Ala Ser Glu Val Leu Met Asp  
 565 570 575  
 Asp Asp Leu Gln Lys Ser Val Asp Met Ile Met Asp Met Phe Cys Pro  
 580 585 590  
 Pro Gly Ile Lys Ile Asp Ala Tyr Pro Trp Leu Glu Cys Phe Ile Lys  
 595 600 605  
 Ser Tyr Asn Val Thr Asn Gly Thr Asp Asn Gln Ile Cys Tyr Gln Ile  
 610 615 620  
 Phe Asp Thr Thr Val Ala Glu Asp Val Ile  
 625 630

<210> 14  
 <211> 1298  
 <212> DNA  
 <213> Homo sapiens

<400> 14  
 atgtctttgg ttccagcaac aaattatata tatacacccc tgaatcaact taagggtggt 60  
 acaattgtca atgtctatgg tgttgtgaag ttctttaagc ccccatatct aagcaaagga 120  
 actgattatt gctcagttgt aactattgtg gaccagacaa atgtaaaact aacttgcttg 180  
 ctcttttagtg gaaactatga agcccttcca ataatttata aaaatggaga tattgttcgc 240  
 tttcacaggc tgaagattca agtatataaa aaggagactc aggggtatcac cagctctggc 300  
 tttgcatctt tgacgtttga ggaactttg ggagccccta tcatacctcg cacttcaagc 360  
 aagtatttta acttcactac tgaggaccac aaaaatggtag aagccttacg tgtttgggca 420  
 tctactcata tgtcaccgtc ttggacatta ctaaaattgt gtgatgttca gccaatgcag 480  
 tattttgacc tgacttgtca gctcttgggc aaagcagaag tggacggagc atcatttctt 540  
 ctaaagggtat gggatggcac caggacacca tttccatctt ggagagtctt aatacaagac 600  
 cttgttcttg aagggtgattt aagtcacatc catcggtctac aaaatctgac aatagacatt 660  
 ttagtctacg ataaccatgt tcatgtggca agatctctga aggttgggaag ctttcttaga 720  
 atctatagcc ttcataccaa acttcaatca atgaattcag agaatcagac aatgttaagt 780  
 ttagagtttc atcttcatgg aggtaccagt tacggctggg gaatcagggt cttgccagaa 840  
 agtaactctg atgtggatca actgaaaaag gatttagaat ctgcaaattt gacagccaat 900  
 cagcattcag atgttatctg tcaatcagaa cctgacgaca gctttccaaa tggagtctcg 960  
 cttcgctctc caggctggag ttcagtggca cggctctggc tcattgcagc ctccacctcc 1020  
 tgagttcaag cttctcctgc ctcagcctcc caagtagctg ggattacagg ctctggatca 1080  
 gtatcattat acgaggtaga aagatgtcaa cagctatctg ctacaatact tacagatcat 1140  
 cagtatttgg agaggacacc actatgtgcc attttgaaac aaaaagctcc tcaacaatac 1200  
 cgcattccgag caaaattgag gtcatataag cccagaagac tatttcagtc tgttaaactt 1260  
 cattgccta aatgtcattt gctgcaagaa gttccaca 1298

<210> 15  
 <211> 340  
 <212> PRT  
 <213> Homo sapiens

<400> 15  
 Met Ser Leu Val Pro Ala Thr Asn Tyr Ile Tyr Thr Pro Leu Asn Gln  
 1 5 10 15  
 Leu Lys Gly Gly Thr Ile Val Asn Val Tyr Gly Val Val Lys Phe Phe  
 20 25 30  
 Lys Pro Pro Tyr Leu Ser Lys Gly Thr Asp Tyr Cys Ser Val Val Thr  
 35 40 45  
 Ile Val Asp Gln Thr Asn Val Lys Leu Thr Cys Leu Leu Phe Ser Gly  
 50 55 60  
 Asn Tyr Glu Ala Leu Pro Ile Ile Tyr Lys Asn Gly Asp Ile Val Arg  
 65 70 75 80  
 Phe His Arg Leu Lys Ile Gln Val Tyr Lys Lys Glu Thr Gln Gly Ile  
 85 90 95  
 Thr Ser Ser Gly Phe Ala Ser Leu Thr Phe Glu Gly Thr Leu Gly Ala  
 100 105 110

Pro Ile Ile Pro Arg Thr Ser Ser Lys Tyr Phe Asn Phe Thr Thr Glu  
 115 120 125  
 Asp His Lys Met Val Glu Ala Leu Arg Val Trp Ala Ser Thr His Met  
 130 135 140  
 Ser Pro Ser Trp Thr Leu Leu Lys Leu Cys Asp Val Gln Pro Met Gln  
 145 150 155 160  
 Tyr Phe Asp Leu Thr Cys Gln Leu Leu Gly Lys Ala Glu Val Asp Gly  
 165 170 175  
 Ala Ser Phe Leu Leu Lys Val Trp Asp Gly Thr Arg Thr Pro Phe Pro  
 180 185 190  
 Ser Trp Arg Val Leu Ile Gln Asp Leu Val Leu Glu Gly Asp Leu Ser  
 195 200 205  
 His Ile His Arg Leu Gln Asn Leu Thr Ile Asp Ile Leu Val Tyr Asp  
 210 215 220  
 Asn His Val His Val Ala Arg Ser Leu Lys Val Gly Ser Phe Leu Arg  
 225 230 235 240  
 Ile Tyr Ser Leu His Thr Lys Leu Gln Ser Met Asn Ser Glu Asn Gln  
 245 250 255  
 Thr Met Leu Ser Leu Glu Phe His Leu His Gly Gly Thr Ser Tyr Gly  
 260 265 270  
 Arg Gly Ile Arg Val Leu Pro Glu Ser Asn Ser Asp Val Asp Gln Leu  
 275 280 285  
 Lys Lys Asp Leu Glu Ser Ala Asn Leu Thr Ala Asn Gln His Ser Asp  
 290 295 300  
 Val Ile Cys Gln Ser Glu Pro Asp Asp Ser Phe Pro Asn Gly Val Ser  
 305 310 315 320  
 Leu Arg Pro Pro Gly Trp Ser Ser Val Ala Arg Ser Arg Leu Ile Ala  
 325 330 335  
 Ala Ser Thr Ser  
 340

&lt;210&gt; 16

&lt;211&gt; 1816

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 16

atgtcttttg ttccagcaac aaattatata tatacacccc tgaatcaact taagggtggt 60  
 acaattgtca atgtctatgg tgttgtgaag ttctttaagc ccccatatct aagcaaagga 120  
 actgattatt gtcagttgt aactattgtg gaccagacaa atgtaaaact aacttgctg 180  
 ctcttttagtg gaaactatga agcccttcca ataattata aaaatggaga tattgttcgc 240  
 tttcacaggc tgaagattca agtatataaa aaggagactc aggtatcac cagctctggc 300  
 tttgcatctt tgacgtttga ggggaactttg ggagccccta tcatacctcg cacttcaagc 360



```

aagtatttta acttcactac tgaggaccac aaaatggttag aagccttacg tgtttgggca 420
tctactcata tgtcaccgtc ttggacatta ctaaaattgt gtgatgttca gccaatgcag 480
tattttgacc tgacttgta gctcttgggc aaagcagaag tggacggagc atcatttctt 540
ctaaagggtat gggatggcac caggacacca tttccatctt ggagagtctt aatacaagac 600
cttggttcttg aagggtgattt aagtcacatc catcggctac aaaatctgac aatagacatt 660
ttagtctacg ataaccatgt tcatgtggca agatctctga aggttgggaag ctttcttaga 720
atctatagcc ttcataccaa acttcaatca atgaattcag agaatcagac aatgttaagt 780
ttagagtttc atcttcatgg aggtaccagt tacggtcggg gaatcagggt cttgccagaa 840
agtaactctg atgtggatca actgaaaaag gatttagaat ctgcaaattt gacagccaat 900
cagcattcag atgttatctg tcaatcagaa cctgacgaca gctttccaag ctctggatca 960
gtatcattat acgaggtaga aagatgtcaa cagctatctg ctacaatact tacagatcat 1020
cagtatttgg agaggacacc actatgtgcc attttgaaac aaaaagctcc tcaacaatac 1080
cgcattccgag caaaattgag gtcatataag cccagaagac tatttcagtc tgttaaactt 1140
cattgcccta aatgtcattt gctgcaagaa gttccacatg agggcgattt ggatataatt 1200
tttcaggatg gtgcaactaa aaccccagat gtcaagctac aaaatacatc attatatgat 1260
tcaaaaatct ggaccactaa aaatcaaaaa ggacgaaaag tagcagttca ttttgtgaaa 1320
aataatggta ttctcccgtt ttcaaatagaa tgtctacttt tgatagaagg aggtacactc 1380
agtgaatttt gcaaactctc gaacaagttt aatagtgtaa ttcctgtgag atctggccac 1440
gaagacctgg aacttttggc cctttcagca ccatttctta tacaaggaaac aatacatcac 1500
tatggcactg ggtattgtac cctccaata tgtgtttgtt atgaccttta cacttgatga 1560
tggaacagga gtactagaag cctatctcat ggattctgac aaattcttcc agattccagc 1620
atcagaagtt ctgatggatg atgaccttca gaaaagtgtg gatatgatca tggatatgtt 1680
ttgtcctcca ggaataaaaa ttgatgcata tccgtggttg gaatgcttca tcaagtcata 1740
caatgtcaca aatggaacag ataatcaaat ttgctatcag atttttgaca ccacagttgc 1800
agaagatgta atctaa 1816

```

&lt;210&gt; 17

&lt;211&gt; 518

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 17

```

Met Ser Leu Val Pro Ala Thr Asn Tyr Ile Tyr Thr Pro Leu Asn Gln
  1                      5                      10                      15

Leu Lys Gly Gly Thr Ile Val Asn Val Tyr Gly Val Val Lys Phe Phe
      20                      25                      30

Lys Pro Pro Tyr Leu Ser Lys Gly Thr Asp Tyr Cys Ser Val Val Thr
      35                      40                      45

Ile Val Asp Gln Thr Asn Val Lys Leu Thr Cys Leu Leu Phe Ser Gly
      50                      55                      60

Asn Tyr Glu Ala Leu Pro Ile Ile Tyr Lys Asn Gly Asp Ile Val Arg
      65                      70                      75                      80

Phe His Arg Leu Lys Ile Gln Val Tyr Lys Lys Glu Thr Gln Gly Ile
      85                      90                      95

Thr Ser Ser Gly Phe Ala Ser Leu Thr Phe Glu Gly Thr Leu Gly Ala
      100                      105                      110

Pro Ile Ile Pro Arg Thr Ser Ser Lys Tyr Phe Asn Phe Thr Thr Glu
      115                      120                      125

```

Asp His Lys Met Val Glu Ala Leu Arg Val Trp Ala Ser Thr His Met  
 130 135 140  
 Ser Pro Ser Trp Thr Leu Leu Lys Leu Cys Asp Val Gln Pro Met Gln  
 145 150 155 160  
 Tyr Phe Asp Leu Thr Cys Gln Leu Leu Gly Lys Ala Glu Val Asp Gly  
 165 170 175  
 Ala Ser Phe Leu Leu Lys Val Trp Asp Gly Thr Arg Thr Pro Phe Pro  
 180 185 190  
 Ser Trp Arg Val Leu Ile Gln Asp Leu Val Leu Glu Gly Asp Leu Ser  
 195 200 205  
 His Ile His Arg Leu Gln Asn Leu Thr Ile Asp Ile Leu Val Tyr Asp  
 210 215 220  
 Asn His Val His Val Ala Arg Ser Leu Lys Val Gly Ser Phe Leu Arg  
 225 230 235 240  
 Ile Tyr Ser Leu His Thr Lys Leu Gln Ser Met Asn Ser Glu Asn Gln  
 245 250 255  
 Thr Met Leu Ser Leu Glu Phe His Leu His Gly Gly Thr Ser Tyr Gly  
 260 265 270  
 Arg Gly Ile Arg Val Leu Pro Glu Ser Asn Ser Asp Val Asp Gln Leu  
 275 280 285  
 Lys Lys Asp Leu Glu Ser Ala Asn Leu Thr Ala Asn Gln His Ser Asp  
 290 295 300  
 Val Ile Cys Gln Ser Glu Pro Asp Asp Ser Phe Pro Ser Ser Gly Ser  
 305 310 315 320  
 Val Ser Leu Tyr Glu Val Glu Arg Cys Gln Gln Leu Ser Ala Thr Ile  
 325 330 335  
 Leu Thr Asp His Gln Tyr Leu Glu Arg Thr Pro Leu Cys Ala Ile Leu  
 340 345 350  
 Lys Gln Lys Ala Pro Gln Gln Tyr Arg Ile Arg Ala Lys Leu Arg Ser  
 355 360 365  
 Tyr Lys Pro Arg Arg Leu Phe Gln Ser Val Lys Leu His Cys Pro Lys  
 370 375 380  
 Cys His Leu Leu Gln Glu Val Pro His Glu Gly Asp Leu Asp Ile Ile  
 385 390 395 400  
 Phe Gln Asp Gly Ala Thr Lys Thr Pro Asp Val Lys Leu Gln Asn Thr  
 405 410 415  
 Ser Leu Tyr Asp Ser Lys Ile Trp Thr Thr Lys Asn Gln Lys Gly Arg  
 420 425 430

Lys Val Ala Val His Phe Val Lys Asn Asn Gly Ile Leu Pro Leu Ser  
435 440 445

Asn Glu Cys Leu Leu Leu Ile Glu Gly Gly Thr Leu Ser Glu Ile Cys  
450 455 460

Lys Leu Ser Asn Lys Phe Asn Ser Val Ile Pro Val Arg Ser Gly His  
465 470 475 480

Glu Asp Leu Glu Leu Leu Asp Leu Ser Ala Pro Phe Leu Ile Gln Gly  
485 490 495

Thr Ile His His Tyr Gly Thr Gly Tyr Cys Thr Pro Pro Ile Cys Val  
500 505 510

Cys Tyr Asp Leu Tyr Thr  
515

<210> 18

<211> 27377

<212> DNA

<213> Homo sapiens

<400> 18

```

gatctttttt tctgggctaa ttcatatgac tcaaattcat tatagttgca taataataat 60
gttatgcttt ttccattttt catttaatag atgttgagat cgttaccagt tttttgctct 120
tacaaataat actttaataa acatccttga atatatgtac ttccatgttt ttacttctcc 180
acaataaact aaaagtgagg tcgatgtatc taaggttatg cacatttttt aatagatgct 240
gccagattat ttaccaaagg tcatagaaat ttatatccaa atagcagtggt aggagaatat 300
actttactca caccttcaca gtattggaag ttaacactat atgtaatttt tgacagttaa 360
gcaggtgaaa ggtgttttct tacttaattt tcctggctac ttggaaactt gaaaatctta 420
ctatatattt acaaacgttt ttaattccct ctctctcaga ttttctgctc ttactcttta 480
tctgattttc tgttgaaatta ttttttgtc agtttgtggg caaccatgta tgttttacac 540
attttcttat ttgactactt ttatggtttc tgccattatt tccatctcat gttgtaatgg 600
ccaatattaa ttactaaatt agatttattg aaattatacc atgccagctt gagatgtcca 660
ttcaagtccct cttgacttgg atttttatac cacttattag caatattgag gatatgtttg 720
tgtatgatgc tttataaaat aaattataaa aacataatgt actgttatgt ataatagaat 780
gtaagctaaa gtgattacaa aatacacatt tttaaagtct taagttcttc tttttagaaa 840
gcattttgta accttagtgc tatgactact acttttgctt tcttgtaga gtaaaatcct 900
atttttgatg ttcatttggt cattctatta aatttcataa gtttactatt ttatccatct 960
ccgcttttat ttctcttaca ctgtattttt tcaacatgat aaaaactttc atacatggta 1020
gaattaaaac agttgtacaa tgaatactca aataactacc agctagactc tccaataact 1080
attttacttt gtgtgctctg tcacgtgtat ttatttctac atatctcttt tttttttttt 1140
ttttcttttg agatggagtc tcgcttcgtc ctccaggctg gagttcagtg gcacggctc 1200
ggctcattgc agcctccacc tcctgagttc aagcttctcc tgctcagcc tccaagtag 1260
ctgggattac aggtgcccac caccacgccc agctaatttt tgtattttta gtagagacac 1320
agtttcacca tgttgccag gctggctctg aactcctgac cttagataat ctgcccgcct 1380
cggcctccta aagtgcagg attacagggt caagccaccg tgctggcct atgtgcctct 1440
tcattcatta atttatattt ttatacatt tcaaagtaag ttgcagacat aagtacattt 1500
tctaaacact gtggtatgaa cataattagc tagagtttag tagttattta gagtttttta 1560
tttttgaggt aaaattagca gtgaaatgga caactttcca ttttatgaac cactccatga 1620
gttttgacta atacataaac gtgtaacca aatccctcta gatttgctgt tctagaactt 1680
tgaaaaaatt gaatcatatg tactcttttt gtatatacta tatgtttttg agagttaatc 1740
acattgttgc atatatcatt agtttgtttc ctttttaatg cctagtcaca tgatatgcgg 1800
tagacatttt ttctttagat aggaatttct agttgttatg acatcatttg tttccttttt 1860
cctattagat ggcttcaatg tctttgtcaa aaatcaagcg agtataaatg tgggcttatg 1920
tctaggcttc ccattcaatg cttactagta tagtgtgaag tatgcatttt ctcacacta 1980

```

aattttcagt	tattgcagca	ccattttgcat	tctccttgca	ttgctttgct	gcttttagtaa	2040
aaaatcaaaa	tacaatgtaa	atgtgggttt	atttccaggc	tctctattta	atttaattca	2100
gttgatctat	ttttcaatcc	tgatgccagt	accgtgttgt	cttaaattac	tgtaagttaa	2160
tagtaagtct	tgaagtcagt	tacatggttc	tccaactttg	ttatTTTTTA	aaatgttatt	2220
taatattcta	gattttctgc	acttccacat	aagtgatagc	atctgctttg	caatctctac	2280
aataaagcct	ctgctatttg	tttgtttgtt	gttgttttga	ggcagagtct	cattctgttg	2340
cccaggctgg	agtgcgaatg	cacaatctca	gctcactgca	gcctccacct	cctgggttca	2400
agtgattctc	atgcctcagc	ctgctgagta	gctgggatta	caggcatctg	caccacactt	2460
ggctaatttt	tgtatttgta	gtagagatgg	ggtttcacca	ttttggccag	gctggctctc	2520
aaactcctgat	ctcaagtgat	ctgcccacct	cagtcctccg	aagtgttggg	attataggcg	2580
tgagccactg	tgcccacccc	agcctctgct	attttcgaag	gattatgctg	aatttacaga	2640
ttaatTTGga	gagaattgat	atcttaacaa	tattgagcct	tctaaatcat	gaatgtggca	2700
tatctcacca	tttatttata	ttttcttcag	tttctctcag	caacgctcca	ttgttttcag	2760
ttctacaatg	aagttgtaat	ggacttaatt	tttttgccct	ttccttttta	taggctctgg	2820
atcagtatca	ttatacgagg	tagaaagatg	tcaacagcta	tctgctacaa	gtaagactat	2880
gtatcatttt	tgagatgggc	acagtaatga	gcataataaa	gtctgcctct	acacttacca	2940
gctaattccat	ttctttctaa	tagtagaaca	catatccttt	aaagctaaaa	atgtccata	3000
tttaactttc	ttcttctacc	gtgtcttgtt	ggcataaaaat	ggaacccata	aagataacgt	3060
gtctttacat	tgcatatttt	aagtcactca	tctctaacag	acttaatgtt	taaaacagat	3120
atgttttaaa	cattaaatac	atgatgtatt	tgaagtcagt	tatctctgtt	agagttacat	3180
gacttaaaat	gtgcaatgta	aagacacata	tctttaaact	attacatgaa	gagttatcct	3240
gtcacatgat	gcattttaaca	gtgtaccata	aaggagctcc	ttgcaatatg	cctcaaaatt	3300
ttaatttaat	gttagtaatg	atagtgtgtc	tatcaagtac	cctccttctg	ctacatcagc	3360
taagattaaa	aaaaaatttt	cagaaaaata	tttttaacca	caaatTTtatt	aaatgtgcta	3420
ttgtaaaaaat	tttaatttct	caaattggag	aaggaagata	acaaatgtga	atggaagaag	3480
gattgatgaa	atcttttaat	gttgtgttgt	aattggaggt	accattatgt	actcatgttt	3540
tctaggtaaa	tacagaagtc	gatgtagctg	tgtgtatgta	tgatacgcat	atattcacac	3600
gtgtacacat	ttgtttatat	tataggggtg	tgtgtgtgtg	tgtgtgtgtc	agtatgaatg	3660
tgtgttcata	tgtaccctat	ctctctctcc	atgaaaaagc	atagaggcag	cagcactcca	3720
gttgccataa	gcacacctgg	tgctcagatc	ttgggtttata	aataatattt	ctctctaaag	3780
gaatcagagc	tccttggtga	aacagcagat	ttctgaacta	gaacaaggga	attacaagat	3840
tagtatggag	taaccttgta	ctagaaaagta	aggggggtct	cagttaatga	tgaaactcgt	3900
caaatggcct	aggatagaac	atgtctagga	acatttgagc	atcaaaacaa	ataatactaa	3960
ttgagttaaag	caggaatgca	tgagcccatg	ttgatgatga	taaaggaaaa	ataaaatata	4020
tgggggttaag	tggaaatata	tttcttaaag	taaaataaca	aatataaaaag	ggataatgaa	4080
attagaaaaa	aaaaagctac	cattttgtaa	ccatgatagt	cattgttgag	ttagttgtga	4140
atctgtggat	tctaaactat	caggatattt	gatgaaaaat	aagatattta	cattttctct	4200
agtataattct	tgttaaatac	aagggggaaa	cagtaagttt	ttagtagaga	agtgattgga	4260
cactaccttt	accagctgaa	taaagttag	gtctacagta	atagaaacac	tcactttgta	4320
tgccccttga	tgtgatgcac	tgagaagcat	acagtatcac	ttacgcatta	ttcctgccaa	4380
aaatgcataa	gctaaatctg	agcctgagga	ataaccagac	aacacccaaa	ttgggtgtta	4440
ttctacagaa	taaatggctg	tactcttcaa	atatatcagt	gttgtgaaaag	ataaagaaaa	4500
gccgaggact	tattttacat	taaagaagtc	taaagagaca	tgagaattaa	atgtgataca	4560
tgggtccagaa	ttggatctta	gacttgaaaa	taaaatgaat	gctaagaaga	acattttgag	4620
gacaattgta	gaaatttgag	taatgtttgt	taattaattc	gattatagta	ataaatcagt	4680
taaatgttct	aatgttgaaa	attgcctgta	attatgtcaa	taaaatgtct	tcttttgaaa	4740
tacatactgg	aggatttaga	ggaaaaggag	cataatgtct	ggtagtattt	ctcaaatgat	4800
tcaataatat	ttatgtgggtg	agagacagat	aaagacaggc	acagtgacaa	tgataaatgt	4860
gcaaaaatgt	taacaattgg	tgaatcttgg	tgaatattat	acagaaggct	tttgtattgt	4920
ttttgcaatt	ttccttaagt	ttgaaagcat	tttaaaatga	aaagttaaaa	acttttaggtt	4980
aaaatatgag	tttgaagcaa	ttgctcttat	cactgtgtag	caatgtacac	taaattgatc	5040
aggcttgcca	atggcctttt	tttttttttt	tttttttttg	aggcggagtc	tcgctgtcgc	5100
ccaggctgga	gtgcagtggc	actatcttgg	ctcactgcaa	gctctgcctt	ccgggttcac	5160
gccattctcc	tgccctcagc	tcccagtag	ctgggactac	aggtgcccgc	caccacaccg	5220
gctaattttt	tgtattttta	gtagagacgg	ggtttcaccg	tgtagccag	gatggctctg	5280
ctctcttgac	ctcgtgatct	acccgcctcg	gcctcccaaa	gtgctgggat	tacaggcgtg	5340
agccaccygc	cccgttgcca	atggcctttt	taaaagcatc	accagctggg	tgcagtggct	5400
cacgcccgtg	atcccagcac	tttgggaggc	cgaggcgggc	agatcacctg	aggacgggag	5460

ttcgaagcca	gcctgaccaa	catggagaaa	ccccgtttct	actagaagta	caaaaattag	5520
ctgggcgtgg	tgggtgcatgc	ctgtaatccc	agctacttag	gaggctgagg	caggagaatc	5580
gcttgaacct	gggaggtaga	ggttgtggtg	agcagagatc	gcaccattgc	actccagcct	5640
gggcaacaag	agggaaactc	cgtctccgaa	aaaaaaaaaa	aaaaaccaca	atcgccacca	5700
caacaaaatg	ttccactgta	ataaatgttc	cactctgatg	taataaatgt	tccactctga	5760
taaaggcaag	tgagaaataa	taaatgatga	atatatttgg	gcagactcat	ttgtcacaga	5820
agtatcttaa	atataaactt	tattaactga	aatatattgaa	aagagggtga	attacttgaa	5880
atatctaatt	aagtgatata	gagagccttg	ttggtaaaact	tctgtccttc	ttggccattt	5940
gctccttgaa	ggaaaaactaa	ttcaacaaga	atttcattgg	attaaagctc	agtactgaaa	6000
ggaattgtct	tcgccattga	ggttaataag	atttgtacat	catttccctt	ttctaaaaca	6060
catgaaagtg	ttaagctaga	atgtatagca	agctgttgcc	ttaagctaag	ggtcaccagc	6120
aattttatac	tttttcccag	taaaaactga	tcactacaat	cccaggccat	ctttccacaa	6180
gtagctgagg	agacctattg	tacctatttc	ccaggcaatt	gctcctaatt	cttttgtctg	6240
agtttttttt	ccagtttgac	tcaacttcct	cttattttttc	ctctccctcc	tcctccactc	6300
cctccttcca	actcccaaaa	cttcctcttc	tccactacta	caccactcct	gtgacagtta	6360
gatcaccctt	aatgtccctt	cctattctta	atctgatttt	ataatgatgg	ttctgtaaaa	6420
agtaactgat	ttgaaacatc	caagagcctg	caataaata	ttgcaataa	tattttacaa	6480
gtgtgttttg	ttacattctt	ttgtggcaga	caccagttag	aacttaaacg	gttgcttagc	6540
gtaatatattt	cttagctaaa	taaaccttgc	ttttttgaat	gcttactagg	cagttaagtt	6600
acttattttct	ttccccaat	tatccagcgt	ttatttagta	cacatttgtt	gagtacctac	6660
tgtgcctggc	actatgctag	tgggccttgg	gtatacatca	gggaataaag	acataaccct	6720
tcctttcatg	gagtgcact	taatagagct	taaattaatt	agattttata	gtatatattt	6780
ggttcaggag	gatgcatgtc	ataaatatga	ttcttgttat	tctgattgaa	tataaaaaatt	6840
ctttacagta	cttacagatc	atcagtattt	ggagaggaca	ccactatgtg	ccattttgaa	6900
acaaaaagct	cctcaacaat	accgcacccg	agcaaaattg	aggctatata	agcccagaag	6960
actatttcag	tctgttaaac	ttcattgccc	taaatgtcat	ttgctgtgag	tattttccat	7020
aataaaaacaa	acgttttcat	attatttgtg	tgtatatgta	cacatatgta	taattttgtg	7080
tcttaggaat	aagtaaatgt	ttaatatata	tatttatattt	tgcaagaatg	gtaaaattttt	7140
taggtaaagt	gctaaattct	tagagaataa	attattctga	tagtaataaa	agtgggtgct	7200
attttcagat	ctaaaattca	gcttagtcac	tctgataaag	gcaaatgaga	aataataaat	7260
gatgaatata	tttgggcaga	ctcatttgtc	acagaagtat	cttctgaaat	ataaaccttt	7320
atttttgaa	atttttgaaa	ggagtgtgaa	ttacttgaaa	tatctaatta	agtataaag	7380
agagccttgt	tggtaaacct	ctgtcctgct	taataactag	aatataataa	tattttccat	7440
aattttcttt	agtaattgag	aattttctcag	tgcttttact	ctgaacatca	gtgattatat	7500
aaatatgtaa	taaatgtata	taactgtttt	gtaatccttt	tactacataa	tcggctcaag	7560
acatatcttg	aaaatcattt	ttaaaagctc	ctcatctttt	tgcaatttgc	ctacttttcc	7620
tctgaatatc	taaaatgatg	ttttggaaaa	tgtagataat	tgatggttat	atgcatttgg	7680
atgccttaaa	ttgagtcttc	actaaaatgt	gtacaatgt	gtaaatatct	atgtacatcg	7740
ccatgtattt	gtgtgcttat	aaattgtgag	tatctgtgtt	cattaatata	catatatattt	7800
ccaatccaaa	atttgggttt	gtttgaagaa	attttttatt	ttaaaatctc	tttaataaaa	7860
atgtgaggga	actgttttta	cccatttgag	cttgaaatgg	tgggtgggat	taaaatgtat	7920
atataaggat	tttagataat	tcttcaataa	ttatcaaaact	ttggtttatt	gaattttgta	7980
aaatcataca	gctttgtaaa	ataaaaccac	tctccgcgat	cattttttta	acaaataagg	8040
atattatctc	agaaattaac	ggaaactgtc	taaagttaac	cagttaactg	gcaacagaac	8100
cagaagaaaag	ccatacacct	tttgattcca	aatgatgcca	tttctgtctac	atggtaccta	8160
accatattgac	ttcttaaaat	tattaattat	taaacagaat	tggaaatatt	attagtttag	8220
aagtgccttt	ctccctaagt	gtggtaagtg	gatattttaac	tggagtgaag	acggggccac	8280
tgcatttttt	tctcctactg	ggaaatttag	cattcttttac	agaggagaaa	aaaattgatg	8340
ctagaaataa	ttatgagtaa	ctttgtatca	caaaaaccagg	catagaaatc	actggtagtt	8400
aatgtaaata	tgatttggat	atacttacct	acaaaatatc	aaataattat	ctattgaaaa	8460
aaagtatttt	gttctgcaaa	gtgaattatc	tccataattt	acataattta	agaaaaagta	8520
actgactcat	ctacatgtaa	gaatgatact	ttttaatttg	ataacttgtt	aaatggaaat	8580
cttcacgctt	acaccaaatt	cgattttctat	catttccattg	ccaataattt	taggcaagaa	8640
gttccacatg	agggcgattt	ggatataatt	tttcaggatg	gtgcaactaa	aacccagat	8700
gtcaagctac	aaaatacatc	attatatgat	tcaaaaatct	ggaccactaa	aaatcaaaaa	8760
ggacgaaaaag	tagcagttca	ttttgtgaaa	aaataaggta	ttctcccgct	ttcaaatgaa	8820
tgtctacttt	tgatagaagg	taagatattt	aagtcactgt	tttgttagaa	tactcctttt	8880
gcatattttt	cctaattaat	tattgtttta	tacatttttac	agacaacctta	gtacatataa	8940

agtaaaaata	gtattttaaat	ttaacaaaat	tgaatatata	tgtaaactag	gttcaaatat	9000
atataagcac	acgttcataa	atztatctta	attacatttg	aaattgtact	tcagactcaa	9060
gtgtaacat	ttaactatat	tggtggattg	cattttat	tgtcaatgct	aagctgattg	9120
tctagttaag	taataataaa	agaggctgat	tgcttatgta	ccattgctgt	tttcttggcc	9180
tctggatgtc	actgttggtt	catagaaaata	gggtgaaagt	catctattgt	atcaaaaatca	9240
aagaagagac	cattgaaaca	agtaaagata	acttgacaag	ttttaaatga	aatttatcat	9300
gtttggtttt	tcattttctt	ttcattttca	tctaattttt	atctcattta	tctaaaatat	9360
gtactgtgaa	ttttttttca	tggtgaaatt	agagtttttc	ttaaggcttc	tcttcccttg	9420
taaccttttc	attgtttttc	ttaaggcttt	ccttcccttg	aaaccttttc	attgtttttc	9480
ttaaggcttt	ccttcccttg	aaaccttttc	attgtttttc	tgaaggcttt	tcttcccttg	9540
aaaccttttg	taatagaaga	aaaatacctt	ctttaatttg	ccttagagta	atattttaact	9600
ttatttttaa	taaatgaggg	aattctatgt	aaattataga	ctttgggtga	ttatgtgtca	9660
gtatagggtc	atttttaaca	aatgtaccac	gctggtagag	gatgttgata	ctggaggagg	9720
ctagcatgta	tggtagaagg	ggatacggaa	aatctctgta	ccttccctct	aattttgctg	9780
tgaacctaaa	actgctcctt	aaaaaaaaaa	aaaatgaagt	cttaaaaaaga	aaacatagaa	9840
tgtacaacac	tgagagtaaa	ccctaataata	gactggactt	tgagtgataa	tggtttgtta	9900
gtaatgtaaa	gtgtggactt	tgagtgataa	tggtttgtta	ctaagttaa	ctgtggactt	9960
tgagtgataa	tggtttttta	aaatagggtt	cttgattgac	taaattttacc	actctggtgc	10020
aagatgttga	taatggggaa	gaggctaggg	gacataggga	aactttgtac	cttttgctta	10080
attttgcagt	gaacctaaaa	ctgcttttta	aaaaaggctt	atttaaaaaa	ataatgagaa	10140
tgtatgtaaa	agcactttga	aatgtaaaag	gaatataaga	aatgtgagct	atttttat	10200
tatgtttcta	agtattataa	cctggaccaaa	gggctaggat	cttactgcag	tatggcactg	10260
ctctgggttag	gaagtaacaa	aatcaaaaaac	tgacctggac	ttagagatga	accaaagaaa	10320
acgatataaa	tacaaagtca	ttcttagact	ttaaggacct	gcagcagat	tcactgatat	10380
tcatgccaaag	ttaatgcagt	tgacactatt	ttattgtgac	catagtttac	attagggttc	10440
actcattctg	ctttacagtt	ctttatgttt	tgacaaatgc	agaataccat	gtaccacca	10500
ttagagtctc	atataaaaca	gtatcactta	atttctgtaa	aagctctaag	atctgtgtcc	10560
agattttttt	ttgcatgcag	atgtccagtt	ttccagtacc	atttcttaa	aagactgttc	10620
cttctccatt	gaattgcctt	tgcttctttg	tcaaaccagt	ttgtgtgaat	ttgcttctgt	10680
gttctctatt	ctgttttaat	ctgtctgtta	ttttccta	atcacacat	ccttatttct	10740
aaagctatat	agtaattctt	gaaattgtgt	agtgtttgtc	ctgcaacttt	cttctttttc	10800
ttgagtattg	tggtggctat	tgtaaatctt	ttgcatttcc	atgtaaactt	tataactcagt	10860
ttgtcaatat	ccaaaaataa	cttgctggga	tttttattaa	gattgccagc	tgggcgagct	10920
ggctcactct	ggtaatctta	gcactttggg	aggccgaggc	aggcagatca	cctgaggctg	10980
ggagtctgag	accagcctga	ccaacatgaa	gaaaccctgt	ctctactaaa	aatacaaaa	11040
tagccaggca	tcattggtgca	tacctgtaat	cccaactact	cgggaggctg	aggcagtaga	11100
atggcttgaa	cccgggaggc	ggagggttgcg	gtgagccgag	atcgcgccat	tgactccag	11160
cctgggtaac	aagagcgaaa	cttcactctca	aaaaaaaaaa	agattgccat	aatctataag	11220
tcacgggtgga	gacagagaac	taacaacttg	atgttattga	cgatgaacat	ggactatctt	11280
tctatgtaga	tcttcttaga	tccctttaac	tagggtttta	tagttttact	catagaaacc	11340
ttataaatcc	aacaaaatat	agatcacatt	ttgttagctt	tatatctaag	tattttcttt	11400
tttggtgcta	attattttaat	gttaaattca	aactttgatt	atattattgct	tatgtatagg	11460
gaagcaattg	attttttttt	taattaacct	tgatccctct	accgttgcta	taattgcttg	11520
ttatttcagg	aatttttttg	ttgtgatttc	ctgtaaacaa	agacagctta	tttcttcctt	11580
cctaataatgt	ataccttttg	tttccctttc	ttactgcatt	agatagggtc	tccagtacaa	11640
tattgaatag	gagcaatgag	agggaatgtt	cttgctttta	tcccagctct	agggtggaaag	11700
tgtcaccatt	aaatgtaatt	ttagctgtgg	ctatttttat	gatgttcttt	atcaagttga	11760
agaagttccc	caatattcct	agtttgctga	gaatttttat	tattaatgat	gttggtattt	11820
atcaaatgct	ttttctattg	catctattaa	tatgatcata	caatttttct	tctttagcct	11880
attaatgtga	taaattacat	taattgattt	tgaggtgttt	aaccagcctt	gcctacctaa	11940
aataaatctc	atttggtcat	ggtgaataat	tattttcttt	tttgattcaa	tttttaaaata	12000
ctttctgagt	atttttttat	gtgttttctt	aagagaagtt	gatcaatagg	tcttcattct	12060
tgtaatgtat	ttggttatgt	attagaatat	tgctggcctc	ataagagtta	ggaaacattc	12120
cctctacttc	cattttctgg	aatacatagt	agagaattag	tgctatttca	gtgtttgggt	12180
agacttagct	attgaaacaa	tctgagcctg	tgacttttt	tcaagattat	tattattgat	12240
ttaatttctc	tatagacata	gacctattca	gattatctgt	ttctcctgtg	gtgagttttg	12300
atagattatg	cctttcaaga	aatggaacca	ttttatctaa	ggtgtcaaac	ttgtgggttc	12360
gaattgttta	taatttttat	ttattattaa	cactatattt	taaactgcat	aacatttaac	12420

ttcctctgaa	acatttttga	ttgtttccaa	ttgaattgaa	tccaatttgt	atggaactct	12480
aatgtcactg	aatcatttta	tcataatatt	tattattaat	acctataatt	tactgaatag	12540
actatgtgtc	aggcactgta	ctagtttagt	attttatctt	taactctcat	aacagttctt	12600
ctgtaagctg	gatatatccc	ctttgtaaac	agaagaggaa	actgagacca	agagaaaatg	12660
gtgaagtact	caaggttaaa	gacttaataa	atgtcagaaa	aaaattcaaa	cttaggcctt	12720
tctgtctcca	tagtccatgt	taaatatttc	tactgattgc	aaataaattg	ctctcagtta	12780
ggatgtctcc	agatacaaac	cttgagaaat	gtagtatgca	catatataca	tgtaaattgtc	12840
tttctttgtt	cttatttcatt	tgtttagcac	atgtttattg	aatgcctact	atgtgccaga	12900
cactgattta	ggcatttagt	gcaatgtagc	aaacacaaca	aagttcttcc	tttcatggac	12960
tttacattaa	gaggaaatca	ctaaaatatt	gatagtaata	gtcactcatg	gctctaagt	13020
ctttacaaat	attaactcat	ttaatcttta	taatgatctt	acagagtaac	attattctca	13080
gttttgcaaa	tggggaaact	gttataccag	agtttaagta	acttgaccaa	ggttgtccag	13140
cttatgtgcc	agagccaaac	tcgtgtgact	ggccagtgtg	aatgactaga	tgagctctca	13200
ccagattctt	tgaaatagtg	tttttgggga	ggaaactcata	gagaaaagag	ttagtgaatg	13260
gtcacctatt	gcagttttga	acagtaggca	ggagtctctt	cagcagggct	aggtatcagt	13320
ctccaaaaga	tagactaact	tttgggctgt	gaaactttta	agtagcatgc	ttagggataa	13380
ttgttttgag	tttttaagca	tgcataatga	gagtttctat	ctagctgcaa	tatgatata	13440
cagaactctg	gcttccagta	acaaagagct	tgggggaagg	aggatgggaa	cagggaagt	13500
taaaatgcc	cagagctcac	cgttcttgcc	aaaattcagc	ccttttctg	gagcaaacac	13560
tccttggaat	gttgaaggcc	tctggtaatt	tccagaattc	taaaaaaggt	tttacagttt	13620
ttgccaatat	tcttactgct	gttatagtca	agtgtgtctt	tggatgtcct	cactctgcta	13680
taccagaagt	gcttctcctt	tataattgaa	tgttgacatt	acaaattcta	cccaaatttt	13740
aggaaataca	cagaggtatt	ttttaaatcc	ttttcatttt	gcctggagag	aggaagcatt	13800
attagctaag	taaaaaggac	actgccttct	aataatggat	gccattggac	aatacttctc	13860
agccagcctg	gtcatttgaa	tgcttactct	gtcatagaat	taactgtgat	aattttccca	13920
ggaaaaatga	acaaatttta	tatgtgaatt	catattacat	gaactactca	tatctatatt	13980
taaatgaaat	attgacctga	aaattgagat	ttaaactcta	aatttgccca	gatattaatt	14040
agtatatagc	aaattagtga	gaatctgac	ataacttagc	ttttaattta	tattcctctt	14100
tttggttatt	tgaaccaaag	tgttcctgaa	ataaagagca	atltgtttaa	atlttaagaag	14160
ttggttaaaa	tttcacaagc	tttatatttt	accaaagtct	cagcattttt	gtgcattgat	14220
tttttttaac	aatgtatagg	attgtacatt	tacaaattaa	tattttttac	atacattcat	14280
tgtctttttc	gttcaatttc	tttagtcttt	tattatacct	cacacgttat	ttaataggac	14340
tgtaactgtc	tacattttat	ttgcactact	tgaaggattt	atlttattct	ttaacaggag	14400
gtacactcag	tgaaatttgc	aaactctcga	acaagttaaa	tagtgaatt	cctgtgagat	14460
ctggccacga	agacctggaa	cttttggacc	tttcagcacc	atltcttata	caaggacaa	14520
tacatcacta	tgggtatttt	gttttgtttt	gttttgtttt	gttttgttta	ttatactttt	14580
aagttctggg	gtcatgtgct	gaacatggag	gtttgttacg	taggtatata	cgtgctattg	14640
tggtttgctg	cacccatcaa	cccgtcacct	gcattaggca	tttctcctaa	tgctgtcctt	14700
cccctagcct	cccacccctt	gacaggccct	ggtgtgtgat	gttcccctcc	ctgtctccat	14760
gtgttctcat	tgttcaactc	ccacttatga	gtgagaacat	gcagtgtttg	gttttctgtt	14820
ctgggtgtag	tttgctgaga	atgatgggtt	ccggctttat	ccatatgcct	ggcaaggaca	14880
tgaactcatc	ctttttttgg	ctgcatagta	ttccatgggt	cgtatgtgcc	acattttctt	14940
aatccagtct	atcactgatg	gacatttggt	atagttccag	gtctttgcta	ttgtgaatag	15000
tgctgcaata	aacgtacatg	tgcatgtgtc	tttatagcag	aatgatttat	aatcctttgg	15060
gtatataccc	agtaatggga	ttgctggatc	aaatgggtatt	tctagtctta	gatccttgag	15120
gagttgccat	accgtgttcc	acaaagattg	aactaattta	cactcccacc	aacagtgtaa	15180
aagcattcct	gtttctccac	attgtctcaa	gcactctgtt	tttcttgact	ttttaatgat	15240
cgccattcta	agtggcgtga	gatggtatct	cattgtgggt	ttgatttgca	tttctctaat	15300
gatcagtgac	attgagcttt	ctttcatatg	tttggtggct	gtgtaaatgt	ctccttttaa	15360
gaactgtctg	ttcatatcct	tcacccactt	tttgatgggg	ttgttttttt	cttttaaat	15420
taagttcttt	gtagagtcta	gatattagcc	ctttgtcaga	tggattgcaa	aaatttctct	15480
ccattctgta	ggttgcctgt	ttactctgat	gatagtttct	tttgccgtgc	agaagctctt	15540
tagtttaatt	aggtcccat	tgtcaatttt	ggcttttatt	gcctttgctt	ttgggtgttt	15600
agacatgaag	tctttgcccc	tgccatgtc	ctgaatggta	ttgccaggt	ttccttctag	15660
gatttttatg	gttttaggtc	ttacatttaa	gtctttaatc	catcttgagt	tgatttttgt	15720
ataaggtgta	aggggatcca	gtttcagttt	cttgcatatg	gctagccagt	tttcccaaca	15780
tttattaaat	agggaaatcct	ttccccattg	cctgtttttg	tcagggttgt	caaagatcag	15840
atgggtgcag	atgtgtgggtg	gtgttttcaa	ctgagaaaaac	ttttggaatt	aaaaactggt	15900

gaagagtaat	ttttattagt	ttatttcatt	ggttactata	tgttcagcat	gaacttacag	15960
tgtatcaact	tatatgtact	agggttttct	ggcatatatac	tgttcttttg	ataagcatat	16020
atagtgaag	tacacgcaat	gtgtgaggca	taaggctgct	gtcttttgat	tcctcagcca	16080
gaggctggta	ctcacttggt	ttctttaaca	gtgaggattt	agattccagt	tacagagaaa	16140
aattcagagc	tgcaaaccta	gtaaaaatta	agtattcaa	tttcagaatt	tctgagccac	16200
taaattacaa	atttgctgcc	actgaaaatt	ggaatataaa	agaattcatt	aggagctata	16260
aacagatttc	tacatttaga	aggagggggt	agggataaaa	tctcctctac	tgcttgatga	16320
aacaatcacc	ctggacacat	tctgatttga	gaaaccttgg	attataacat	atgttttatc	16380
atcctattcc	tctttctttc	cgacttctac	atttgtagca	attagtagtc	attgtcataa	16440
tgtgtaaatc	ctgattgaaa	aattatatac	tggttgaaaa	atattatacg	gtaagcatga	16500
tacctcccta	attgtgtggt	aaagtcactg	ttaggcattg	ccctctgtcc	ttccaacata	16560
tcataaaatt	ttagccataa	agcgaaagtg	tatgccactg	acttaaatct	ctgtgttata	16620
gctgttttta	ctgatatact	cagtgtctaa	ttctccctct	cattagactc	atgatctgag	16680
agtccatctt	ttttgaaaat	aaaatgattt	ttaattaagc	caattaatta	aaaaattaaa	16740
actcataaaa	ttcagttttt	cttgatataa	aagtcactga	gctttctctt	tttgcattgt	16800
catcctcgct	cacttgcttt	tggtctttcc	cctttctctc	tattttgctc	tgccagctat	16860
gggcaccgtg	acgcgtctaa	accaggaaa	gaaatattca	tattcatttt	aaactctgaa	16920
atactactac	ttcttttact	agaagtctca	aaaaaattac	cttaaggacc	ccattttttt	16980
tttttttttt	gagatgaagt	cttgctctat	tgcccagata	ggagtgcagt	ggcatgatct	17040
cagctcactg	caacctctgc	ctccccggtt	caagcgattc	tcctgtctca	acccccccgc	17100
cgagtagctg	ggactacagg	catgcaccac	taacaccogg	ctgattgttt	cgtattgtta	17160
ttagaaacga	ggtttcacca	tggtggccag	gctggttttg	acctcctgac	cttaggtgat	17220
ctgcccacct	cggcctccca	aagtgcctgg	attacagggtg	tgagccactg	tgcccacca	17280
aggctgttga	ctttttactg	gttgcttcaa	aactaaggca	aatgctgttc	acactccaga	17340
ttttaagaca	tttttacatt	ttttattact	tgagtttcat	catcaaaagc	cagtatatct	17400
tttaattgat	tcttcttttt	atttttgggt	tatgaaataa	ttttaactta	tagaaaaatt	17460
aaaaaagtaa	catcacaaca	attacgtatc	caccatttag	atttaacaaa	tcgtaacggt	17520
ttgacattat	ttcagacttt	tttttttttt	tttttttttg	gagacagtgt	cattctgata	17580
cccaggctga	agtggcatga	tttcagctca	ttgtagcctt	gacatcctgg	gctcaagcaa	17640
tcctactatc	tcagcctccc	aactagctgg	gactacagggt	gcacaccacc	acacctggct	17700
aatttttgta	gggatggggg	tttgccatgt	tgcccaggct	gttcttgaa	ctggaggttc	17760
aagcaatctg	cctaccttgg	cctccaaact	tttttttttt	tttttttttt	ttatttttaa	17820
gaaattaaat	gttacagaga	agtagtataa	tgccatatca	atcccttctc	taactctttt	17880
ttctcagagg	tagctacttt	tccaaacttg	gattaaatcc	ttctcatcaa	tgtttttatg	17940
ccttcattat	atgtgtgaac	tcttaagcag	tatggcatat	ttttcatttt	ttaaatttat	18000
ataaactgtt	tcgtactatg	ccaagccttt	tcagacttgc	tttttttgat	tcattaaaaat	18060
tttcaagatt	taccactatt	gacgcattga	gatttagatt	atttaacatc	tttggagtat	18120
gttatgaaat	atcagaattt	attagcctat	tttccattta	atggatatgt	gttatttttt	18180
gtttcattta	cagaccataa	tgaagtcacg	ttatatgttt	tcttgcttat	ttcccttgtc	18240
ataaaatgag	ttcagtgggt	cataaacagt	ttttttttta	attatatgat	gtggttgtag	18300
taaaaaatgg	aalagagagg	aatggataat	agagaacatt	ttacacagta	agggtcagtg	18360
ttgtttccta	aactttcatt	tcaattgtat	gtgtatgtat	gtattactaa	gatatgatat	18420
taaatgaatt	tcttactgtg	agtccttaac	aaaaatgttt	gaaagttact	cctaagggtg	18480
ttacctgaaa	ttagaattac	tggattataa	ggtgtatata	agttttgctt	tatgggaaga	18540
aataccaaat	tgttcttccc	atggttttta	caatatatgg	tcccatcagt	aatgtataaa	18600
attttagttt	ctaccaagtt	cactccaaca	cttggtatta	gtctatttct	gtctgatact	18660
tggcattaat	tttgtaattt	tgtagggcca	gcgagcatca	gatggatatcc	ataatgtttt	18720
tatttgattt	tcctagatgt	ctagtgtgtt	taagcagccc	ccgtgtttat	cagctacata	18780
ggtttctctac	tctatgaatt	ccatgttcac	atcttttgcc	tgtttttcta	tgtaggttact	18840
gatttctttg	ttggttcattg	tgtgagcgca	catacatgta	attgattgta	aggtttcttt	18900
ccgtgttaga	gatactaata	tttgctcagt	tcattccatac	ttctagtgtg	ttccatgcct	18960
ttttaacttt	atgggtttctt	gtgtttttata	ggttttttta	aaatttttgt	ttggttaattg	19020
ctttatagggt	tactctcatc	cctttgcttt	caagtttctg	gcattctaat	ttgtatgtca	19080
ctcataaata	aaagcttatg	gctaaatttt	agtttttaata	gtggagttaa	aatatgttct	19140
taagttattg	atatattttag	tttatgtttc	taattttttc	tgtttccctt	ttcactgctt	19200
tggaagtaag	tagttctgta	tttaattttg	acttaaatatc	cttaattttt	aatttttata	19260
ctaactttta	taatgtctaa	tgctaataca	tatcgtagtc	tttttcttag	gcaataatat	19320
tcttttgta	aattgacatc	ttttattaga	aaagaaacac	ctatatattt	aataaataga	19380



agggtataag	atgtaatgtg	gttaccctct	tgttttcctc	aaagtgcaaa	tgaaaacaaa	19440
ttgcatggac	ctttcgaact	tttattttta	ttcaagtata	tcttttcgaag	tatatatttct	19500
tatcaacatc	tcataaacat	tatgatgatg	cataataaaa	aataaattac	tcataggttaa	19560
aatatgttgg	tattcaagta	aagcaaaaata	actgtactac	acaatgcaca	acttttagtgt	19620
atttgttagt	cttagattta	tatacatttc	aaaagttaac	tatggaatta	ggcatcataa	19680
actacaaacc	tctggatatg	tgttacttaa	aaatattaat	tatctagaat	cttgcattgtt	19740
gtgactggtt	agtaattttt	ctctattggc	catattttatt	aacactttga	atttattaag	19800
atattactta	cagaggccag	gtatgggtgc	tcacacctgt	aatcccagta	ctttgggagg	19860
ccaaggcagg	cagatggcct	gagctcagga	gttgagacca	gcctgggcat	tgtggcaaga	19920
ccctgtctct	ataaaattac	aaaaatcacc	caggcatggg	gggttgcaac	tgtggttcta	19980
gctacttgga	aggctgaggt	gggaggctca	cttgagccca	ggaggcagag	gtgacagtgc	20040
ctgggtgaca	gagtgcagacc	ttgtcttaaa	aaatatatat	atatagatat	agatatagat	20100
atagatatag	atcatagaat	cagagaattc	ttagagatga	tcattttctt	caacttttca	20160
ttttaacaaa	taaggaaatt	gagagcaaaa	tttaattaatg	atttggacct	ggaaccgagc	20220
accctgttct	caatttagag	ttgtttattc	tgaatcttat	actgtctttt	ttattgcctt	20280
tatgtaataa	gcttactctt	tcataattct	cttgtgaaac	aaacaagcac	attacaatat	20340
aggggatgca	gtattcttct	gtttaataat	ttatatttta	aaactacaca	tgttttagca	20400
gtaaaaagtt	ataacaaaca	agctaaatta	tttttaataa	tttatgggtc	tttcttttat	20460
aaatttcaga	tgtaaacagt	gttctagttt	gagatccata	caaaatctaa	attccctggg	20520
tgataaaaca	tcgtggattc	cttcttctgt	ggcagaagg	tagctaaatt	tccatgcctt	20580
gcaattttta	ctgtttgttt	acaagggtat	ttcactactt	tatatctcag	tatacctgaa	20640
agtataacctg	ttccttcttt	gtatacttat	tccttcctct	gtaagataaa	cagactttgt	20700
aaattttaaag	atatctgcca	agccttccct	tagtctgtat	ttcttcaagc	aggcaccgtc	20760
acatactttc	ccctatgcct	tactattttg	tttttccctc	tcagtaagca	ttccacttta	20820
ccagtgcctt	tctcagaatt	tggcattcag	agctggacat	tgtgctgcag	atgttgtttg	20880
gccaattcag	aatagagtga	aattattatt	tacctgaaac	tggacactca	gcttctacta	20940
gcctgaaatg	tcattgtata	gctatttatt	tgtacacttg	gttttgtttt	ctttcctttt	21000
tgatacagcc	atctcatggt	ttatttggtg	tccagtgaac	tcctaggggc	ctgtcacatg	21060
aacttcttga	acttgggtct	ctcattctat	tcttaaatga	attttttttt	ctgtcacatg	21120
aacttcttga	acttgggtct	ttcgttctat	tcttaaatga	atatctttgt	ttttatgggt	21180
cctgggagta	gggtgctaagt	tcacttttct	tagtttttagt	tcacagtttt	aacctattga	21240
gaccttttga	agcctaaaat	tcagttcccc	tgtattaatg	tctggtgtat	gccctagttc	21300
atgtctgtat	gtcctaattt	attcttactt	tcctgttaa	ttagttatac	tgtttaaata	21360
tgggttccac	agataaaagc	taataaaaca	ttctataaat	tgagtatctt	ccattttcaa	21420
acaagaagat	atttatctta	acctgtgaat	tttcatttta	cccagtatgt	ctaatttctt	21480
atttcttcct	tatcttacca	aattattaaa	tctcagattc	tgacattctt	gtccattcaa	21540
ccagatgata	tccctttttt	ctttttttaa	gttataaatt	attcccctag	cttataatag	21600
aaaggagaga	ggcatgctaa	aacgggtatt	aactgcatgc	tatttttttag	aatattctgt	21660
attttaattt	tatctttcat	aaaactaaca	tgcaatgagt	tacattttcat	gaatcacttt	21720
ttgtgggttc	tatggaggct	atcaactggt	ttttttattt	atttattttt	atttattttg	21780
agacagagcc	ttactctgtc	gcccaggctg	gagtgcagtg	gtgcaatctc	gactcactgc	21840
aacctctgcc	tcccagggtc	aagcaattct	catgcctcag	cctccagagg	agctggaatt	21900
acagggtgat	gttaccagc	ctagctattt	tttttggtat	tttttagtaga	gacagggttt	21960
catcatggtg	gccaggctgg	tcttgaactc	ctcaagatcc	gcccagggtga	tctgcccacc	22020
tcagcctccc	aaagtgtctga	gaatacaggt	gtgaggggtgt	caacttattt	taaatacgtt	22080
aatattttaat	caaaaagatt	aaattgctta	tcataagata	ttctccctat	gtaggtatag	22140
tgaaatattc	caaaatgaat	ctgctaaatg	agcttaatta	taggttgagt	atctgtggag	22200
ttaaaaacac	aaactgtcct	ctgctctgcc	accacagcaa	tcagcgacaga	agacttatgt	22260
gaccaaatgc	ataggggttt	tcacccacac	accaagcagg	caatccctca	gcagacgcca	22320
gctgggtgtc	ctccagttca	attctgacac	tatctacctg	gagataatgc	caagtttttc	22380
tttgatctt	gagttatttt	agtaaataaa	atttacaggt	ctatactatc	ataaaaacaat	22440
tttaacttta	ccttgataat	aagggaatagc	agactcatat	ggtttgatct	ttttttcctt	22500
cactagcact	gggtattgta	cccctccaat	atgtgtttgt	tatgaccttt	acacttgatg	22560
atggaacagg	agtactagaa	gcctatctca	tggattctgt	aagtatcaga	ggtaataaag	22620
atatttttaa	ttaaaaaata	atattttaaa	aattgaatac	atttattcat	acctgctttg	22680
ttcctaaaag	gacttaaggc	accttaaaaa	tataagtaaa	atatgagcac	ataaatcttg	22740
aatcatctgt	gtatgtatct	ctttttttat	ttgacactaa	atcttaacat	ttgaatagtg	22800
aaaaattaag	gaacagggat	ttaaagagtc	attccctata	ccatggccaa	aatgcagaga	22860

tacggccaca	ctatggaagc	attattttgta	gtcaacattt	tatcgtactt	ttgtttgttt	22920
gtttgtttgt	ttgtttgttt	tttgagatgg	agtcttgtct	tgttgcccag	gctggagtgc	22980
agtggcacga	tctcagctca	ctgcaacctc	cgcctcccgg	gttcaagcag	ttctctgcct	23040
cagcctccca	agtagctggg	attgcaaggta	tgcaccacca	cgcccagcta	atTTTTgtat	23100
ttttgtagag	acagggtttc	accatcttgg	ccaggctggt	cttgaactcc	tgacctcatg	23160
atccaccac	ccttggcctc	ccaaagtgt	gagattacag	gcgtgagcca	ccgtgcccag	23220
ccttgatcat	actttttaaa	cctccacatt	tcatattaga	ggaatgaagt	tactttaaca	23280
gggaagatag	atattattgt	ataaagtttt	gaggcagtct	acaaaacctt	cctcatttct	23340
gacactaatt	gcaattggaa	gtcctcaagg	ccactcttag	atTTgataat	tcacaagact	23400
cctagaactc	actgaaaact	gttatactga	cagttacaga	ttattacagc	taaaggatgt	23460
acattaaaat	cagataatga	aagagatgta	taggacagag	tccaggaaag	ttccagacat	23520
ggaacttata	gttgtcctct	ccccatagag	ttgtggactg	ttactttccc	tgcaacagtg	23580
tgtagcagta	tacataatat	attgccagat	agggaaagctc	tgctaaaaga	ttttagtggg	23640
actctatcac	gtaggatatgg	ttgactgccc	atatggctga	tcatagtctt	cagccccctc	23700
tgagatcaag	ctgataccac	atgctccaaa	ctttccaccc	tacatcatat	tgttaaacta	23760
ttcatagtga	cccagggtt	ccaggcaaaa	atacttctat	caagtgtgac	atagaaaggg	23820
cttagagatt	acgttccaca	agctaagggtc	aaagcccaga	cctctcttag	ggtaaaagtt	23880
aaatgtttac	tacatggatt	ggaaaagatc	tgagttatag	ttgagaggag	aatttttctc	23940
ccacctacac	aattcattta	acctttcatt	aaatatTTaa	tgagcacctg	ctatgtacta	24000
ggtactatcc	tatgtgatgg	agacacagcg	gtgaacaaag	taaacaaaat	tccttccctc	24060
ttgaaactta	taacatagta	gggaagagaa	aaattaaata	actatataat	acataactg	24120
tatgttatat	tcatttaagc	ttagcacaag	attttttttt	ctatgcacaa	agagaatagt	24180
cagcctcatt	gtttttaaat	cattattacc	atcatcatta	ttaaatcaga	gcaatttact	24240
tgattacgtg	tatctcaaag	ctatttttaag	attaaagagt	aaataagatt	ttggagtTga	24300
gaccagcatt	ctagtTttatg	aattctacaa	tcttgataga	gggaaactgt	ctagattatc	24360
ttttaattgg	acaatattga	aatatgtgtt	aataataaca	ttaaaaagga	ttaatattat	24420
ttcctttttt	tttctctcat	gaaacatttt	taaggacaaa	ttcttccaga	ttccagcatc	24480
agaagttctg	atggatgatg	accttcagaa	aagtgtggat	atgatcatgg	atatgttttg	24540
tcctccagga	ataaaaaattg	gtaggcaaga	atatttttaac	aatcccacac	ttcttttact	24600
tgagatagca	ctaacatata	tgtactctgt	ggacttttag	aagtctgaaa	gctttgcttc	24660
caaagtattt	actaagtagt	gagtgattac	tctatgatca	acctttgatg	aagagagtgg	24720
cagggataaa	atagttatga	atcataattc	ctgcagtc	aaagattttta	aaatattttt	24780
aaatatagga	aaggagagata	gttttgatca	caagcacatt	tgacattgtc	atgctacaag	24840
catttttagtt	gaaattagac	caaaagtgat	gaattgttgg	cagtaaacat	tttctgtaac	24900
aaactccaat	tatccaattt	aattcatgga	ttaatTTTTt	tatttattgt	taactagttt	24960
cagattttac	aagcttttTgt	tttaccatt	ttttgtgagc	tttgttttct	gcataaacat	25020
ttgattaata	aaccagatct	tcctcatttc	aaattgtact	gcttatacct	gctgccactg	25080
aattttcctt	ctgtgactat	atTTgtactt	atgTtgaaac	ttgcagatct	aagtcatatt	25140
aagacaattt	tgatttttct	aacaattttt	tatcgttagga	aatttttacc	gctgcagatt	25200
tagcagctgg	tttaattttt	atatactatt	tttaatcagg	ctttactctc	cctggTcaat	25260
ctttgcatct	tataatagtt	acataatgat	aggaattTgt	gttgatctct	aaccaagtTt	25320
aacttgaata	cctttatttg	ttgtcagttt	taattTgtgt	taactgtttg	gattcttttg	25380
gatagatttc	tagaagtaag	tcttttatatc	caaaagcatg	ggcctggtag	accatttTga	25440
accactattt	tagattttta	aaatatatac	caaccatttt	gaaacccaag	atgtactcac	25500
tgttacctgc	ttgtggcaaa	aaattcaaat	tagtcacaat	tgctccaaaa	caataacatg	25560
aatctagtat	gtattttgaa	gagagaataa	tgTtaaattt	ggaagggacg	tttacttact	25620
tttcaagcca	aaataaatgt	taatttttct	agctcagtgg	taagcttagg	tacctatttc	25680
agagtatttt	atTTTgtttt	aatggTtaaa	tcgctttttt	tgTttttgtt	tttTtagatg	25740
catatccgtg	gttggaatgc	ttcatcaagt	catacaatgt	cacaaatgga	acagataatc	25800
aaatttgcta	tcagattttt	gacaccacag	ttgcagaaga	tgtaatctaa	tattgccatc	25860
caatttagca	tacataaaaat	gttgccactc	accttccctg	tttgagcttc	tttctctgac	25920
ctgagttttg	tatcagcaat	gttgatgatg	ttagcatggg	tatgggatta	gaaaatgtcc	25980
ttaccttaaa	tctctTggct	tttactgggt	gcaaggTaaa	taatggctat	ggattttTgt	26040
ttgctttctg	ttttgctttt	gtacaaagag	acctgcttaa	acaagtactg	ctgagataag	26100
tgctctgatca	agctacagtg	tacttttaagt	agaaatggca	aagTtgcttt	gttggggTgc	26160
tgatactgat	gatttttagga	taaatttcatt	tctttaaact	tgtaatacat	ggttttattg	26220
cttgTttctc	tccaggatag	tagagatttc	tctatttcac	ctcaacctaa	taaaagtTgt	26280
cagattttata	atgttaatga	cttaatatata	tccttttcta	atagtctcat	gtaaaatatg	26340

```

ccgctattac aacttacaac taattgaatg agatgttaac ttagtaaaat agtttgattt 26400
ttacctgaca gtgtttgtca aattttaaatt catgaatatt caattttata caaacattta 26460
tatatatata tatagatttg tgtatgttat ttgccaaaga cagatataaa ttacctgggt 26520
taatattagt gaagaataaaa taagtgcaca ctttcaact gtttcattta tttgccctaa 26580
gttgagctga aaaatgatat gaggcaaaga atcgaaatag gtgtggcaat gcagcagatg 26640
tttagggctg tctacatccc aggtactgtg ctaagcacta aacatgtatt tgatcctcac 26700
agcaacctat ttttccgata agaaatctga ggcttgattg ataagctgac ttgactaagt 26760
tcacacagtt tgtaaaaagct agagtctgtg ccttaattca cataatctct attcagagcc 26820
tgtactgtta accactcaag gattctggaa cagaagctaa cagtttctg caacgagtct 26880
ttgacttaaa catctgaaat aacattggaa atagattata agaggagtca gtgtgttttt 26940
ctatagtttc aaaatacttt taacatctta ttgtcaaaaa gattggataa ctgactttct 27000
ttgctcataa taactctaaa ttctagttcc tgagtacatt aacacatctt ctttacctaa 27060
ctaccaatgt ccccatcat cgacttatca gcttgtttga gacaatgaga aagactgatt 27120
ttattttcaa gaatatagac tcttggttca aaacattttc aggaaaaata ttttaaaacc 27180
ctacagttga acaggtgtgt ttccgtgttg atgatgtgct caggatacaa aggtgaaata 27240
aacatttttt ctgccttcag gaagccctca atctagaaga gtagagggtc aaaggtgcc 27300
tatgttcaca ctgtgagcct gcaagatctc cacgttaaca aaggaaaact cttcctatga 27360
atcttcatga tgatagg                                     27377

```

```

<210> 19
<211> 30
<212> DNA
<213> Homo sapiens

```

```

<400> 19
ccctaaccct aaccctaacc ctaaccctaa                                     30

```

```

<210> 20
<211> 30
<212> DNA
<213> Homo sapiens

```

```

<400> 20
ttaggggtag ggtaggggtt aggggtaggg                                     30

```

```

<210> 21
<211> 60
<212> DNA
<213> Homo sapiens

```

```

<400> 21
ccctaaccct aaccctaacc ctaaccctaa ttaggggtag ggtaggggtt aggggtaggg 60

```

```

<210> 22
<211> 18
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: Telomeric
      primer PBoli82

```

```

<400> 22
tgtggtgtgt ggggtgtgc                                             18

```

<210> 23  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
       SpPotlp-binding oligonucleotide

<400> 23  
 ggttacggtt acaggttaca

20

<210> 24  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
       SpPotlp-binding oligonucleotide

<400> 24  
 cggttacacg gttacaggt

19

<210> 25  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
       SpPotlp-binding oligonucleotide

<400> 25  
 gttacaggtt acggttacgg

20

<210> 26  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
       SpPotlp-binding oligonucleotide

<400> 26  
 tgtggtgtgt ggggtgtgcgg tt

22

<210> 27  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 SpPot1p-binding oligonucleotide

<400> 27  
 ggttacacgg ttacaggta caggttacag 30

<210> 28  
 <211> 43  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 SpPot1p-binding oligonucleotide

<400> 28  
 ggttacacgg ttacaggta caggttacag ggttacggtt acg 43

<210> 29  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 SpPot1p-binding oligonucleotide

<400> 29  
 ctgtaagcat atcatcattc gaggttac 28

<210> 30  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 SpPot1p-binding oligonucleotide

<400> 30  
 ggttacgcat atcatcattc gaatctcg 28

<210> 31  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 SpPot1p-binding oligonucleotide

<400> 31  
ctgtaagcat atcatcggtt acggttac

28

<210> 32  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
SpPot1p-binding oligonucleotide

<400> 32  
ggttacggtt accatcattc gaatctcg

28

<210> 33  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
SpPot1p-binding oligonucleotide

<400> 33  
ctgtaagcat atgggttactc gaatctcg

28

<210> 34  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
SpPot1p-binding oligonucleotide

<400> 34  
ctgtaagcgg ttacggttac gaatctcg

28

<210> 35  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
SpPot1p-binding oligonucleotide

<400> 35  
ggttacaggt tacaggttac

20

<210> 36  
<211> 20

<212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: hPot1p-binding  
 oligonucleotide

<400> 36  
 ttagggtttag ggtaggggtt

20

<210> 37  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: hPot1p-binding  
 oligonucleotide

<400> 37  
 ggtaggggtt agggtttaggg

20

<210> 38  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: hPot1p-binding  
 oligonucleotide

<400> 38  
 ttagggtttag ggtaggggtt agggtttaggg

30

<210> 39  
 <211> 45  
 <212> PRT  
 <213> Schizosaccharomyces pombe

<400> 39  
 Met Gly Glu Asp Val Ile Asp Ser Leu Gln Leu Asn Glu Leu Leu Asn  
           1                  5                  10                  15

Ala Gly Glu Tyr Lys Ile Gly Val Arg Tyr Gln Trp Ile Tyr Ile Cys  
                   20                  25                  30

Phe Ala Asn Asn Glu Lys Gly Thr Tyr Ile Ser Val His  
           35                  40                  45

<210> 40  
 <211> 43  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: C-strand  
binding specificity of SpPot1p

<400> 40

cgtaaccgta accctgtaac ctgtaacctg taaccgtgta acc

43

<210> 41

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PBol1109  
oligonucleotide

<400> 41

ccgtaagcat ttcattattg gaattcgagc tcgttttcga

40

<210> 42

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PBol1164T  
oligonucleotide

<400> 42

ttcagatggt atctgtcaat cagaacctg

29

<210> 43

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PBol1194B  
oligonucleotide

<400> 43

gaacactggt tacatccata gtgatgtatt gttcc

35

<210> 44

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 44

tgaaggctcg agtcaacgga tttggt

26



<210> 45  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 45  
catgtgggcc atgaggtcca ccac